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Solves abrasion and hardness problem

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Compounds using Hycar 1072 provide far more abrasion resistance than any other rubber—even more than is called for in this tough application. During laboratory abrasion testing, the garnet paper used in the test actually wore out without making any headway against this Hycar compound.

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For further information on properties of Hycar 1072, write Dept. KA-10, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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Rubber Age

COVERING THE MANUFACTURE OF RUBBER AND RUBBERLIKE PLASTICS PRODUCTS

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Highlights Sidelights *of the News . . .*

October, 1958

High attendance marked the 74th meeting of the Division of Rubber Chemistry, ACS, held on September 10 through 12 in Chicago . . . The three-day meeting featured the presentation of 31 technical papers as well as the presentation of the Charles Goodyear Lecture by Dr. J. C. Patrick . . . The meeting also featured a Suppliers' Cocktail Party, the Division banquet and a meeting of the Twenty-Five Year Club (page 104).

The 50th Anniversary of the Teaching of Rubber Chemistry at the University of Akron was celebrated on October 3 with a program which included the presentation of honorary degrees to Drs. Whitby and Waterman . . . The meeting also featured a symposium on "Macromolecules and Elastic Networks" and the dedication of the Rubber Science Hall of Fame . . . Principal speaker at the banquet was Dr. Waterman, director of the National Science Foundation (page 108).

Robert V. Yohe has been elected president and chief executive officer of B. F. Goodrich Canada, Ltd., succeeding Ira G. Needles, who has been named chairman of the board (page 130).

At its recent convention in Miami Beach, Fla., the United Rubber Workers Union resolved that its future conventions will be held in states which do not have "anti-union" laws . . . Also passed was a resolution calling for international officers of the union to guide the Economic Policy Committee in negotiations for a six-hour day (page 114).

J. Ward Keener, president of the B. F. Goodrich Co., has been named chief executive officer succeeding John L. Collyer who remains as chairman of the board (page 107).

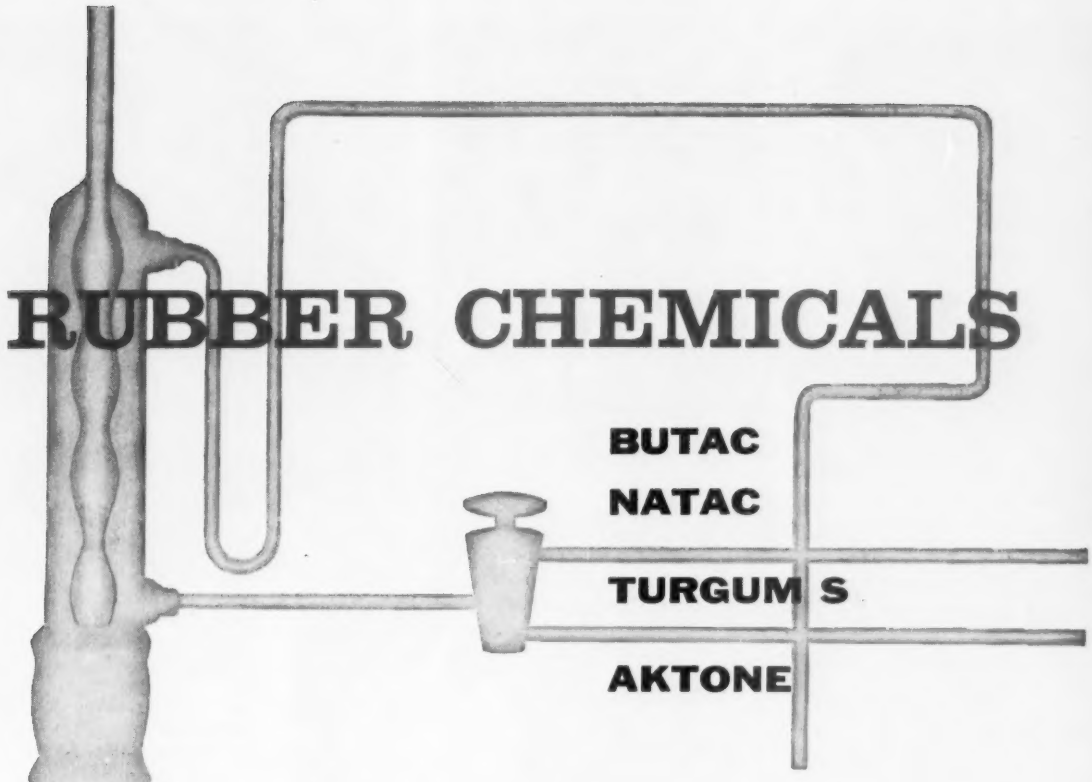
Voit Rubber has started construction of a 60,000 square foot factory and office building for its Tread Rubber and Tire Repair Materials Division . . . The new factory will be located in Santa Ana, Calif. (page 128).

As This Issue Went to Press . . . .

Announced, the election of E. J. Thomas as chairman of the board of the Goodyear Tire & Rubber Co. succeeding P. W. Litchfield, who has been named Honorary Chairman.

News of the untimely passing of T. A. Werkenthin of the Bureau of Ships.

Complete Stories Will Appear in the November Issue



RUBBER CHEMICALS

BUTAC
NATAC
TURGUM S
AKTONE

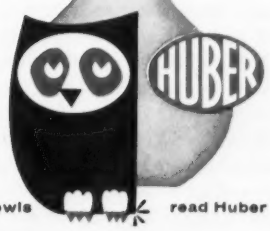
BUTAC—Plasticizer and Tackifier for GRS. Improves pigment dispersions, tensile strength, resistance to tear, sheet embrittlement and cut growth.

NATAC—Similar to Butac but designed for natural rubber and natural rubber-GRS blends. Inhibits sulfur and stearic acid bloom on unvulcanized stocks.

TURGUM S—Plasticizer and conditioner for GRS. Retards cross-linking of GRS at mixing temperature, improves pigment dispersion and tack. Produces high tensile strength, high resistance to tear, heat embrittlement, and cut growth. Provides processing safety for scorchy stocks.

AKTONE—Activator for Thiazole and Thiuram accelerators. Produces marked increase in activity with little increase in scorchiness. Particularly effective in blends of GRS and natural rubber. Widely used to eliminate odor of blowing agent in closed-cell sponge.

For Rubber Reinforcing Pigments, Think of Huber



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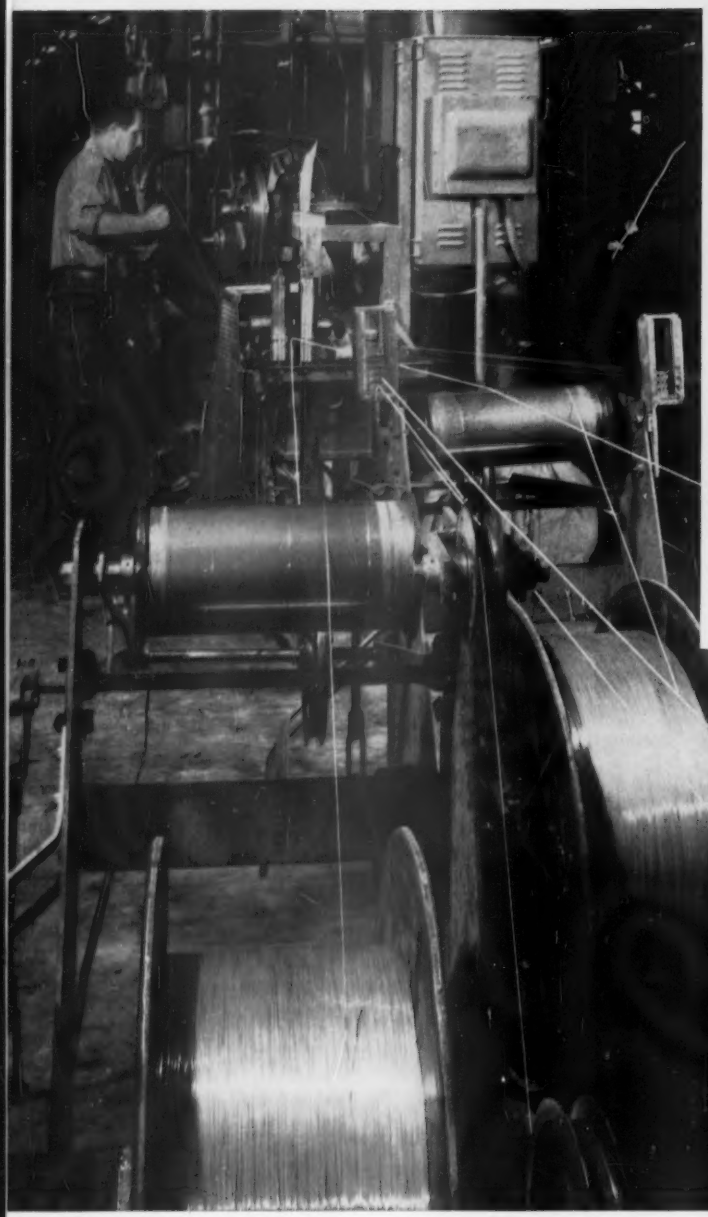

Strength is built into tires here where tire beads are built on special machines. From these pay-off reels, tire bead wire is gathered in the specified number of strands and insulated and coated with rubber to form a flat, tape-like band. The finished bead has the job of holding the tire firmly to the wheel. That's why . . .

Here the tire bead gets a wrapping of rubberized fabric called cover stock. This cover stock holds the wraps of the bead firmly in place and also helps the bead become an integral part of the finished tire. At the bottom of the picture are beads as they left the bead-building machine. At the top are beads covered with fabric.

General's Beads Keep Tires Safe

Johnson Steel Co.'s Tire Bead Wire Builds Strength, Long Life Into LCM Giant Tires

While keeping ahead of automakers' demands for better tires on heavier, more powerful new cars, The General Tire & Rubber Co. also built added strength and safety into the big tires used in off-the-road equipment.

As off-the-road rigs grew in size and capacity, the giant tires made for the logging, construction and mining industries became larger, more durable and stronger.

General's LCM Giant Tires measure up to eight feet in diameter, weigh up to 1,900 pounds and contain as many as 30 plies. Each of the eight beads in a giant may have as many as 17 wraps of bead wire, like that supplied by Johnson Steel & Wire Co., Inc. And each wrap, or layer, may contain as many as 12 strands of rubber-coated bead wire.

Giants equipped with beads made of Johnson Wire can take recap after recap. All through the rugged service which tears off treads, the steel beads buried out of sight near the tire's edges continue to do their primary job of holding the tire to the rim.

Beads are so reliable that tire failure due to bead trouble is virtually unknown.

In this accomplishment, Johnson Steel's wire mills and General Tire technicians form a combination that pays off in exactly the right kind of wire from the mills and more effective and efficient tire engineering.

Johnson Steel provides bead wire —bronze-plated for good adhesion between steel and rubber—of high, uniform quality. Because the wire meets General Tire's specs consistently, tire engineers can blueprint bead designs for different types of tires with confidence that the wire will perform as expected.

Close-up shows how strands of bronze-plated steel bead wire get a coating of rubber which provides insulation and prevents flexing of wire in use.

Tire bead is placed on a giant tire after addition of filler material and a flipper of fabric. Filler and flipper help the tire maker firmly attach the bead to the plies seen on the drum. A giant tire like this requires four beads on each side, and is rated at 36 plies.

• **12 Strands Of Bead Wire**—Engineers may vary the number of wire strands used—four in a typical passenger tire. The number of times a rubber coated tape of the strands is overlaid in a circular pattern helps determine the size of the final bead.

By specifying the number of strands, the number of wraps and the quantity of beads used in a tire, engineers match tire performance with the demands to be made upon it.

That explains why General Tire is particular about the bead wire it buys and why Johnson Steel draws bead wire from tested heats of steel with exacting care.

At General Tire, every shipment of incoming wire is subjected to tests for tensile strength, elongation, adhesion qualities, uniformity of bronze coating, breaking strength and torsion strength.

• **Ability Pays Off**—Johnson Steel's ability to meet these requirements gives assurance to users of all kinds of specialty wires that Johnson can and will meet their demands for uniform high quality.

This ability pays off for General Tire in helping the tire manufacturer maintain its fine reputation for safety and long service.

Passenger car owners get exactly the same wire as contractors who buy LCM Giant Tires. It's .037 gage tire bead wire, plated with bronze in the ratio of one gram of bronze for every kilogram of wire.

Johnson Steel & Wire Co.'s success in finishing bead wire for all types of General Tires is typical of Johnson's achievements in the whole range of fine wire specialties, everything from music spring wire to aircraft cord wire and including:

Armature binding wire, belt hook wire, bobby pin wire, gutter broom wire, card wire, shade roller wire, flexible shaft wire, textile industry wires, hose reinforcement wire, rope wire, safety pin wire, shaped wire, staple wire, metal stitching wire, Signal Corps wire and MB spring wire.

If you use any of these wires it will pay you to ask a Johnson representative to explain what benefits you can expect from the uniformity and dependability of any Johnson steel product. You'll find him at the nearest district office listed below. He's as near as your telephone.

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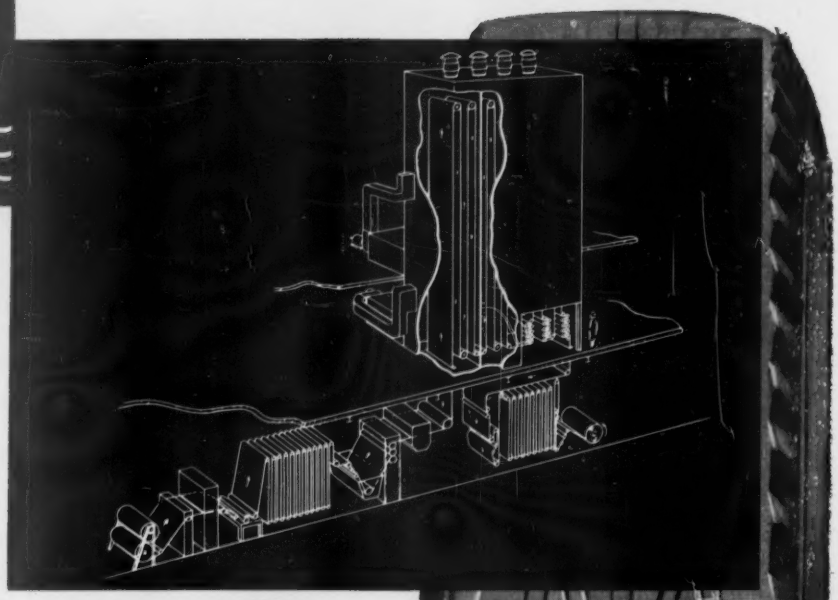

TIRES

...product of an 'Engineered Atmosphere' plus mechanical ingenuity

Statistics indicate that at least 75% of the passenger car tires made in the United States and a large part of those made abroad are processed in the Ross-Waldron Cord Tension Latex Dipping and Drying Unit.

Three typical operational steps are involved: (1) Latex dipping and drying of the 60" web with its 2,000 individual cords followed by (2) application of heavy tension (30,000 pounds) across the entire width while (3) passing through a heat tempering zone of 450°F. or more and subjected to the proper time exposure as related to machine speed; followed by a relaxing heat zone of 450°F. or lower temperature with an application of 30,000 pounds tension on the web. Production speed is 10 to 100 yards per minute. Processing skill can be found in the design of the Latex dipping and curing unit and by the control methods set up to assure a satisfactory end product. Mechanical ingenuity is reflected in the Tensioning System.

Ross-Waldron since 1935 have engineered and built over 70 units for practically all domestic tire manufacturers; and over 25 units for foreign tire plants throughout the world.

Many of the units for domestic and foreign plants were designed to treat both rayon and nylon tire fabric at tensions and temperatures as required.

In the rubber field numerous Ross Curing Ovens can be found, which include one of the largest Airfoam installations, designed, built and installed for Goodyear Tire & Rubber Company in 1956. This unit consisted of pouring, jelling, curing, stripping, cooling, drying and conditioning.

Other fields served in connection with 'Engineered Atmospheres' include pulp, paper, plastics, foundries, metal painting, pharmaceuticals and chemicals.

* John Waldron Corporation, an affiliate of J. O. Ross Engineering, has devoted practically all of its business life of 132 years to the engineering, design, and manufacture of web-processing machinery. Ross and Waldron engineers work together on many projects of which this Tire Processing Unit is an excellent specific example.

M-R

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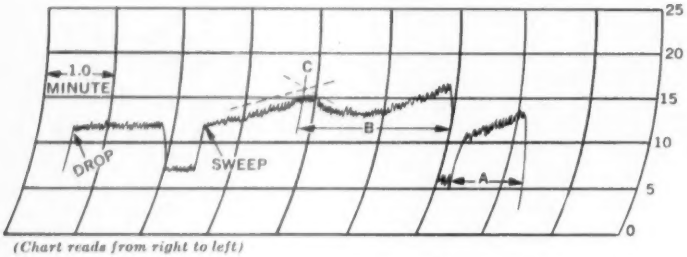
Hypothetical Processability Test Chart



(Chart reads from right to left)

A. Polymer breakdown time interval **B.** Pigment incorporation time interval

C. Point of complete pigment incorporation

That's right! For the first time—in any rubber—you can be sure of processability – bale after bale, shipment after shipment.

How? Simply by specifying PLIOFLEX for all your styrene rubber needs.

Why? Because Goodyear, through refinement of a previously developed test, has been able to establish a new control over processability.

Here's how it works: A laboratory Banbury is loaded with the polymer to be tested, under a specific set of operating conditions. The polymer is masticated. Then certain pigments are added and the time for their incorporation carefully determined.

Pigment incorporation is the chart-indicated

And here are typical PLIOFLEX rubbers with their Assured

PLIOFLEX 1006: A hot, nonextended, fast-curing rubber—protected by a nonstaining, non-discoloring antioxidant—used in white sidewall tires, shoe soles, housewares, toys, sporting goods, flooring and many other products where light color is important. **APF**—2.40

PLIOFLEX 1500: A cold, nonextended, easy-processing rubber—protected by a staining antioxidant – exhibits higher abrasion resistance, tensile and modulus than corresponding hot rubbers—used in camelback, tires, molded and extruded goods where color is not a factor. **APF**—1.25

PLIOFLEX 1502: A cold, nonextended, light-colored rubber—protected by a nonstaining antioxidant—used in white sidewall tires, shoe soles, mechanical goods and items where easy processing, excellent physical properties and minimum discoloration are required. **APF**—1.40

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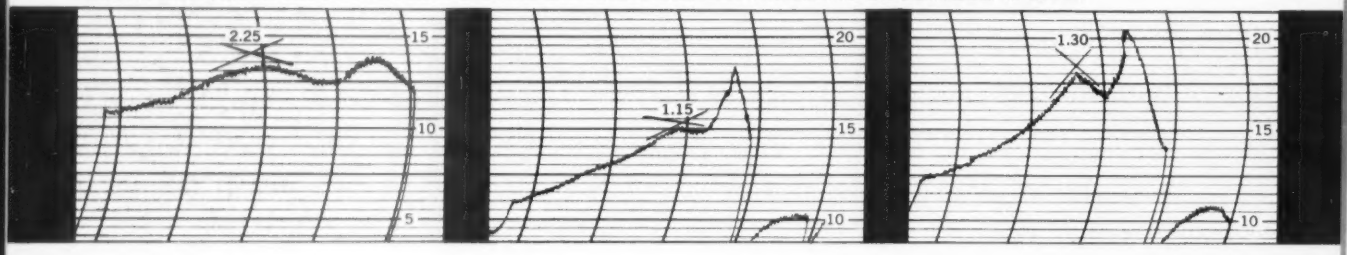

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time, in minutes, from the point where the ram is lowered on the pigment-polymer mix to where there is a peak of power consumption followed by a sharp drop. Pigment incorporation time is an excellent gauge of polymer processability and, in hundreds of tests, has proved to be readily reproducible.

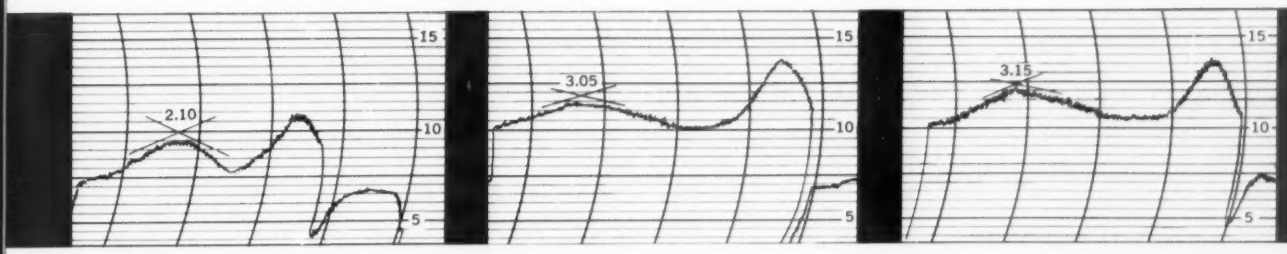
The result? Another industry first – assured processability. Goodyear has set up a production specification, based on maximum pigment incorporation time, which establishes a reproducible control over the processability of every type of PLIOFLEX offered. This means that no matter what type of PLIOFLEX you order, or when you order it, you will know its relative processability and know that it will be consistent. And this is something you could never before be sure of, in any type or brand of rubber.

Processability Factors – maximum pigment incorporation times!

PLIOFLEX 1712: A cold rubber extended with 37.5 parts of highly aromatic oil–protected by a staining antioxidant – exhibits outstanding physical properties at low cost–for camelback, tires, mechanical goods and products where color is not of prime importance. **APF**–2.25

PLIOFLEX 1773: A cold rubber extended with 25 parts of naphthenic oil–protected by a nonstaining antioxidant – used in shoe soles and heels, toys, flooring, and other items where excellent physical properties and light color at low cost are desired. **APF**–3.15

PLIOFLEX 1778: A cold rubber extended with 37.5 parts of naphthenic oil–protected by a nonstaining antioxidant–low in cost–used to manufacture many light-colored products for which similarly extended polymers previously were considered impractical. **APF**–3.25



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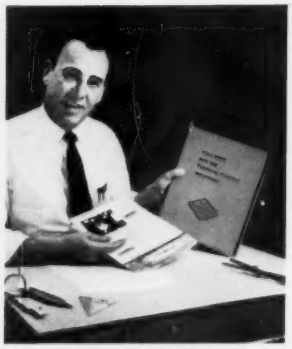

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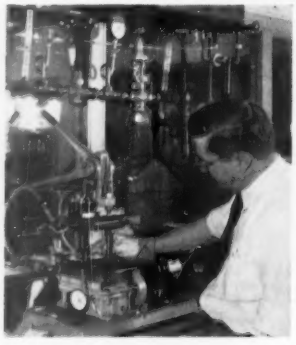

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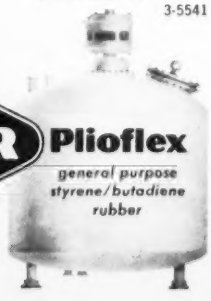

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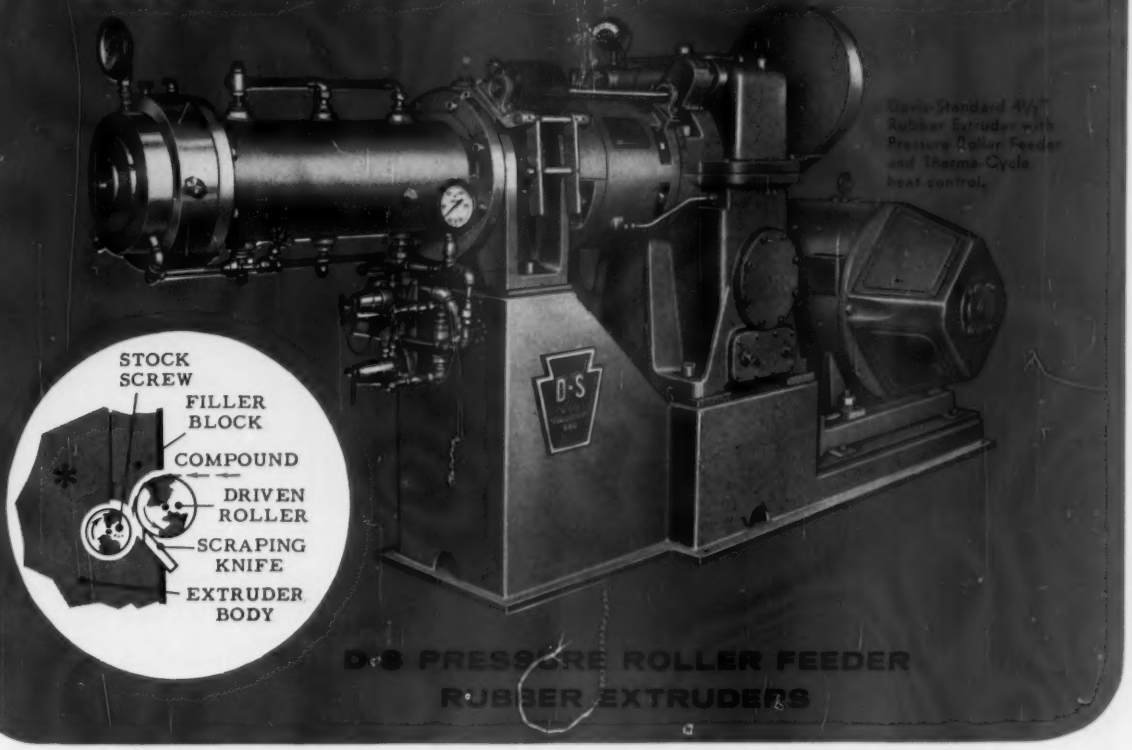

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Davis-Standard Rubber Extruders with Pressure Roller Feeders for low-tensile stocks and Automatic Roller Feeders for harder compounds hold consistent delivery tolerances within 1% on stocks which formerly were difficult to feed — even by hand. Ball regurgitation, which often causes starvation of the screw, is prevented.

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✻ Both the *Automatic* and *Pressure* Roller Feeders employ a highly-polished chrome-plated roller. A filler block is added to the feed throat, and a scraping knife is positioned against the roller to prevent film build-up.

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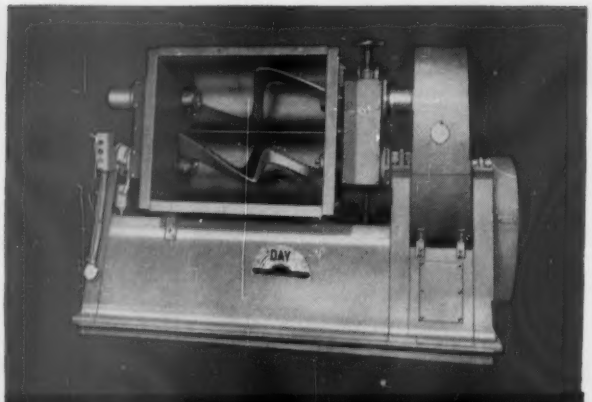
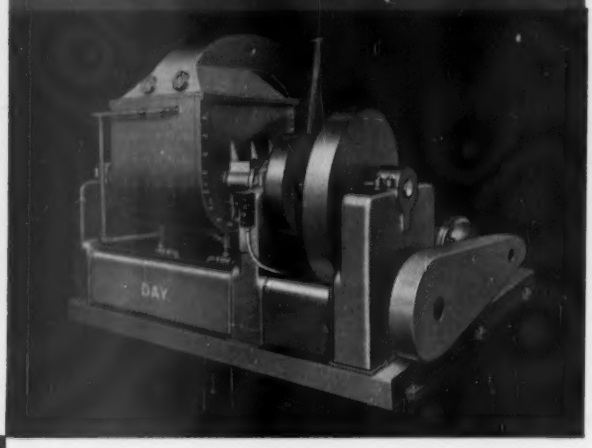
DAY IMPERIAL



DAY MOGUL



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double arm mixers give
thorough dispersion
dependable operation
fast production

DAY IMPERIAL mixers meet every requirement for heavy duty kneading and mixing, and are the result of sound engineering, superior design and superior construction. Counter rotating agitators with 3 to 2 ratio insure thorough mixing and shearing action. Air seal stuffing boxes protect your product from contamination, and guard the heavy duty bearings from damage by abrasive mixtures. Everything about a DAY mixer is heavy, rigid and built for long service. In 35, 50, 100, 150 gal. working capacities—plain or jacketed tanks, tilting or non-tilting.
DAY MOGUL mixers are the "big boys" in our line. Their effortless mixing of extra heavy materials, like rocket fuel, flushed colors, pastes, putties, furnace cements, etc., means speedy, economical production. They have all the design features of the Imperial and are available in 2½, 5, 100, 150, 200, 300, 600 gal. working capacities.

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Shop Talk . . . . .

► Regular readers of this journal will likely note that this issue seems a bit different than its predecessors. And in fact it is. Firstly, the October, 1958, issue of RUBBER AGE is now in a new size. For years the over-all size of this publication measured 8¾ by 11⅝ inches. It now measures 8¼ x 11¼ inches.

This has been done in accordance with modern publishing practices and will make, among other things, for easier handling at the Post Office. Attentive readers will also note that the column widths have been slightly reduced.

Extensive reading tests carried on for many years have indicated that a narrow column of type is easier to read than a wide column of type. We have therefore adjusted our column widths so that the individual reader will be able to handle his copy of RUBBER AGE with the greatest possible ease.

In publishing a journal such as this we must keep abreast of the latest technology in the rubber industry and pass this information along to our readers. By the same token, we must also keep abreast of the latest publishing techniques. It has long been our opinion that no matter how worthwhile the message, no one is going to read it if it appears in type best suited to a telephone directory.

So then, we try to provide the best possible framework for the printed word so that you will find the reading pleasant and without accompanying eye strain.

We would like to emphasize that in adjusting the size of RUBBER AGE and in realigning our columns we have in no way reduced the amount of reading matter in each issue. For years we have prided ourselves on the fact that we have always carried the greatest amount of editorial material appearing in any rubber journal. We will continue to do so.

Now that we have discussed the magazine itself and what appears within its pages we have one other bit of news to discuss. For many years past, we have been mailing RUBBER AGE in a heavy manilla envelope. This issue comes to you in a new dress, a specially designed wrapper. This wrapper, too, is a product of the latest publishing techniques.

Magazines in envelopes are apt to "jiggle" about. This "jiggling" may cause the envelope to tear. Thus, when a reader receives his copy it may be damaged to some extent.

The new wrapper is designed to eliminate this problem. Each issue of RUBBER AGE should reach you the way it left the bindery — clean — intact — readable. We have often made the point that a trade publication is a product and as a product it must be wrapped carefully and attractively. It is hoped

Your BEST BET...

for better floor tile production!

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REINFORCING HIGH STYRENE RESIN

ON THE FLOOR OR THE KITCHEN DOOR—SCORES OF HOUSEHOLD USES

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Marbon "8000-A" is the superior-processing resin which fluxes rapidly at lower temperatures (165-175 degrees F.). For improved dispersion, shorter mixing cycles, cleaner brighter colors and faster heat-plasticizing action with lowered power demand, you can't beat this outstanding high styrene resin. Contains all of the reinforcing properties of Marbon 8000 — Gloss — Durability — Dimensional Stabilit;.

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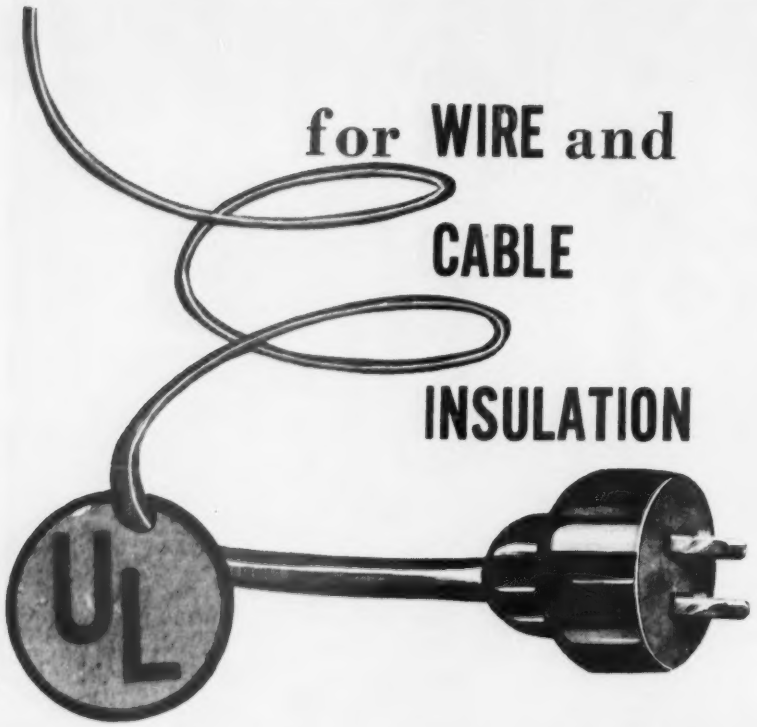

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BLACAR® 2700: UL-approved primary insulating material designed for low cost building wire applications — specifically: T, TW, TF, TFF, type wire (including oil exposure at 60°C).

Provides excellent processing features, high extrusion rates, good electrical properties, plus a smooth glossy finish. Ideal for use as a general-purpose material for a wide range of low-tension wires and cables.

BLACAR® 2600: UL-approved vinyl insulation material for type T, TF, and TFF wire and cable applications. BLACAR® Compounds are available in natural, white or black — in powder, diced or pellet form.

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If your needs are special—Cary can modify existing formulations or custom-formulate to the most exacting requirements.

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Shop Talk . . . . .

that the new wrappers will accomplish this end.

The new size, the new column widths and the new wrapper are only part of the efforts we make to assure that the ultimate reader gets the best product we are capable of producing. We hope that these changes meet with your approval. Of course, we will listen with great interest to any comments on the subject you may care to make.

► The new size of RUBBER AGE will still require printed words—and we believe that we have assembled a fine collection of words for the November issue. One of the articles scheduled discusses a new method for the qualitative identification and quantitative estimation of many of the more common antioxidants in miscellaneous rubber compounds.

Another of the scheduled articles is devoted to a study which indicates that the high temperature limits of bonded assemblies may have to be revised considerably. Temporary bonding—another subject of interest—comes up in the November issue in an article discussing the temporary bonding of nylon to rubber. Here, a new process is introduced which permits complete separation of fabric and elastomer by washing in warm water.

The U.S. Army Prosthetics Laboratory has also come up with an interesting article, this one devoted to determining the discoloration of rubberlike films by reflectance spectrometry.

One of the "Special Industry Reports" published in recent months had to do with the subject of executive compensation (yes, even executives like to get paid). Reasonably enough, this article was very well received. It is with pride then that we announce a follow-up article on the subject for our November issue. This article will bring the statistics on the subject up-to-date and offer a good deal of new information. Look for it.

► This past week brought us a new thrill akin to the birth of a baby. This particular baby was the first issue of our new sister publication ADHESIVES AGE. The months and, in this case, even years of preparation have now culminated in a new product devoted to the vital adhesives industry.

Many of us in the rubber industry have more than a passing interest in adhesives. To those who have any degree of interest in the adhesives field we suggest you avail yourselves of an opportunity to see a copy. All you need do is drop us a note. We will be happy to send one along at no charge. It may even be that you will want to become a charter subscriber to the new publication. Cost for domestic subscription? $5.00 a year.

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The new, completely different Holmes Hydro-Moldic Production Molding Press is not only ideal for long runs--but it is particularly suited for short runs too. In small or large plant, it will quickly recover its low, initial cost. It will pay you to send for illustrated descriptive folder--today.

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TITANOX* to the rescue! Part of the appeal of vinyl-covered furniture lies in its light or pastel finish . . . and part of the appeal of TITANOX titanium dioxide white pigments is how economically they produce properties of whiteness, brightness and opacity in plastic or rubber stocks. Whether your formula calls for TITANOX-RA, TITANOX-RA-50 or TITANOX-RA-NC, you'll find these leading white pigments a pleasure to work with—in uniformity that permits easy regulation of opacity and tint, in the contribution they make to product durability, and in ease of processing. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities.

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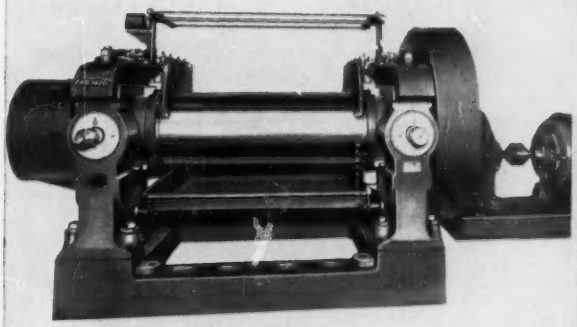
for the RUBBER and PLASTICS INDUSTRIES

EEMCO mills for mixing and compounding rubber and plastics are available in all sizes from laboratory mills up to and including 84″ mills in standard or custom units.

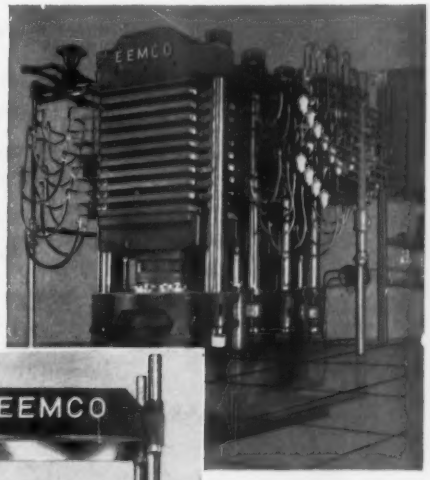


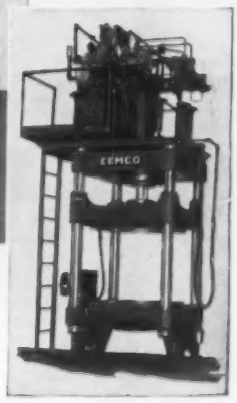
HYDRAULIC • • PRESSES

for RUBBER and PLASTICS PROCESSING

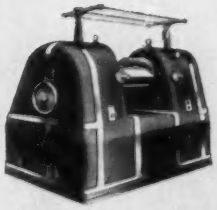
REINFORCED PLASTICS MOLDING

EEMCO heavy duty hydraulic presses are also available in a complete range of sizes from the 12″ x 12″ 42 ton laboratory press up to any size required. EEMCO designs and builds special presses to meet the customer's requirements.





EEMCO furnishes complete installations for reinforced plastics molding—presses, hydraulic units, preform machines, roving cutters and ovens.



Call or write us for complete details. We will be glad to discuss your "Mill and Press problems"—of course, at no obligation to yourself.

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MILLS • PRESSES • LOADERS • LIFT TABLES • PLATENS • PREFORM MACHINES • ROVING CUTTERS

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CARBON BLACK HANDLING SYSTEMS

FOR UNLOADING AND STORAGE, KENNEDY Systems

- provide automatic handling—no bags, pallets, fork-lift trucks, manual labor
- provide separate storage for various grades of black
- are completely enclosed for reduced losses, easier housekeeping
- are panel controlled for simplified operation, easier inventory control

FOR AUTOMATIC DISTRIBUTION, KENNEDY Systems

- are completely controlled and monitored from a central cubicle
- transfer each black from storage to Banbury weigh centers as needed
- avoid contamination between different blacks being handled

FOR ACCURATE PROPORTIONING, KENNEDY Systems

- include feeders which provide uniform "Stream-in air" for close weighing tolerances
- use scale which automatically weighs up to 4 blacks in sequence with "over-under" tolerance control and tare check
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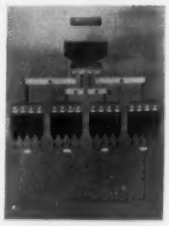
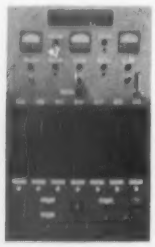
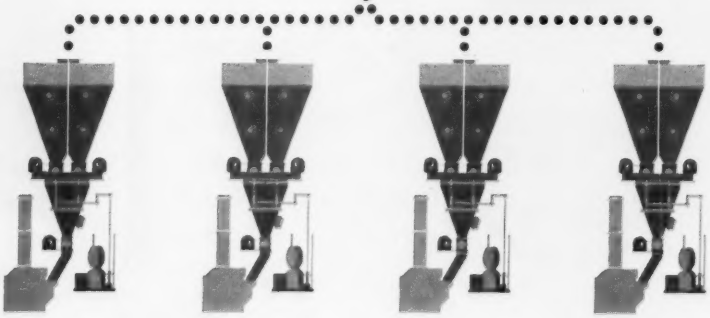
Ask a KENNEDY *Engineer to show you how these systems can improve your carbon black operation. There is no obligation.*







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MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

New Ameripol rubber cuts compounding costs, yet retains end product advantages

Goodrich-Gulf research has produced an important new key to economies in rubber production. Ameripol 4700, a new 50-part oil-extended rubber has been added to the Goodrich-Gulf line to reduce costs with little or no effect on end product properties for most applications.

In fact, tests show that Ameripol 4700 has higher average tensile strengths than many 37½-part oil-extended rubbers, yet the cost is significantly lower. Modulus of Ameripol 4700 is higher, too. And hardness is maintained.

In addition, Ameripol 4700 offers important advantages for applications where light color is desired. It can be used in many color applications where lower oil extended rubber is now being used.

Ameripol
THE PREFERRED RUBBER

Goodrich-Gulf Chemicals, Inc.

For drying rubber and rubber-like materials

Tests show how new, lower-cost 50-part oil-extended rubber retains properties

Tensile tests show that Ameripol 4700 actually provides higher tensile than many 37½-part oil-extended copolymers. Ameripol 4700 offers a tensile of 3010 psi, which is only slightly lower than the tensile of Goodrich-Gulf 37½-part oil-extended compound, Ameripol 1708. And both of these tensile strengths are well above the tensiles of competitive 37½-part oil-extended rubbers.

Physical data, shown below, demonstrates how Ameripol 4700 can cut costs without seriously affecting end product properties. It will pay in saved production costs for you to examine the advantages of Ameripol 4700 for non-staining applications, or Ameripol 4701 for staining applications. For samples and more information, write Goodrich-Gulf Chemicals, Inc., 3121 Euclid Avenue, Cleveland 15, Ohio.

PHYSICAL DATA COMPARING AMERIPOL 4700 TO 25- AND 37½-PART OIL-EXTENDED RUBBERS

			Ameripol 4700
OIL EXTENSION-PARTS	**25**	**37½**	**50**
Tensile Strength			
50 minute cure @ 292°F	3800	3345	3010
Elongation (%)			
50 minute cure @ 292°F	725	700	675
Modulus @ 300% elongation (psi.)			
25 minute cure @ 292°F	350	405	450
50 minute cure @ 292°F	785	770	785
100 minute cure @ 292°F	1165	1090	1055
Mooney Viscosity ML4 @ 212°F			
Raw	60	60	57
Compound	55	56	54
Price per pound	$.2060	$.1910	$.1750

Ameripol
THE PREFERRED RUBBER

Goodrich-Gulf Chemicals, Inc.

For drying rubber and rubber-like materials

you get – **LESS DRYING TIME**

LESS "DRYING SPACE"

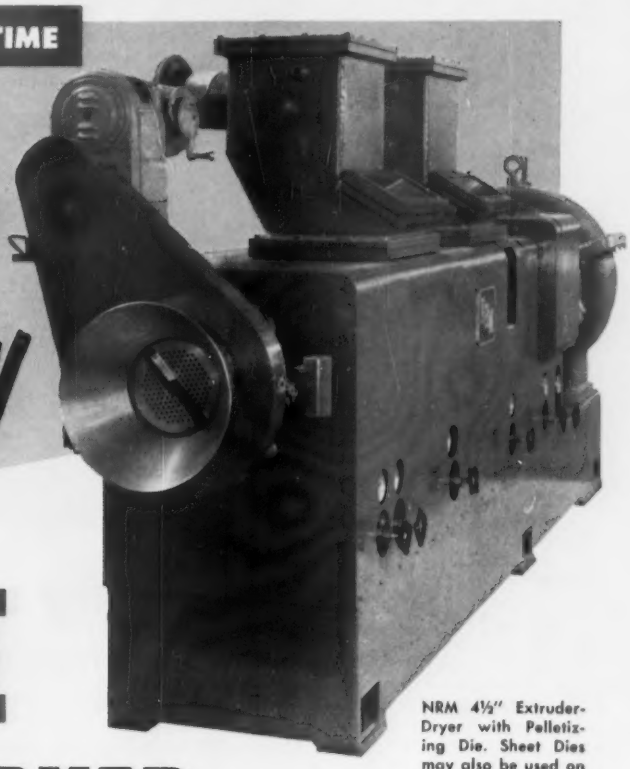
LESS CONTAMINATION

LESS MAINTENANCE

with the NEW

NRM

EXTRUDER-DRYER



NRM 4½" Extruder-Dryer with Pelletizing Die. Sheet Dies may also be used on the Extruder-Dryer.

The Extruder-Dryer is NRM's answer to the rubber industry's need for a faster, more reliable and more space-saving method of drying natural and synthetic rubbers, and dielectric rubber stocks. The machine is a single screw devolatilizing extruder with a three-section cylinder. Stock from the coagulator is fed into the first section where a new-type feed screw reduces moisture to as low as 5%. In the second section, stock is metered through an adjustable choke into a multi-stage devolatilizing area where remaining moisture is flashed off under vacuum. The third section forwards the rubber to the die.

The die may be a perforated plate with rotating cutter blade for pelletizing the dried stock, or a sheeting die.

The NRM Extruder-Dryer is designed to eliminate the complicated equipment of conventional rubber drying methods, their maintenance and contamination problems and excessive floor space requirements, yet provide highly efficient drying. The drying ability of the Extruder-Dryer is below ½ of 1% total moisture at compatible extrusion rates.

Let us discuss your rubber de-watering requirements and recommend the right type and size NRM Extruder-Dryer to do your work most efficiently and economically.

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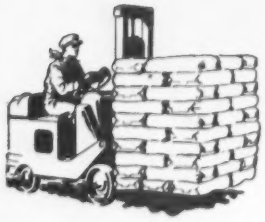
CUT COSTS BOTH WAYS with PROTOX®-166 ZINC OXIDE

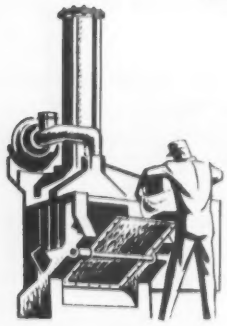


1. Cut Handling and Storage Costs

Protox*-166 is dense. It bulks only about half that of conventional zinc oxides.

Thus you can handle Protox-166 faster and store it in a smaller space.

2. Cut Processing Costs



Protox-166 is outstanding for dispersion. It disperses readily in any rubber under any weather conditions . . . because it is free of aggregates and its particles are coated with zinc propionate that is readily wet by rubber.

Protox-166 is outstanding for calendering and extruding. It provides smoother calendering with less shrinkage, smoother extruding with less die swell, and longer runs on strainers.

Thus you can cut processing time and step up output with Protox-166.

* U. S. Patents 2,303,329 and 2,303,330

THE NEW JERSEY ZINC COMPANY

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*Philprene** *reduces mixing time!*

CURRENT PHILPRENE POLYMERS		
	NON-PIGMENTED	PIGMENTED WITH PHILBLACK*
HOT	PHILPRENE 1000 PHILPRENE 1009 PHILPRENE 1001 PHILPRENE 1010 PHILPRENE 1006 PHILPRENE 1018 PHILPRENE 1019	PHILPRENE 1100 * * PHILPRENE 1104 * * (Pigmented with EPC Black)
COLD	PHILPRENE 1500 PHILPRENE 1502 PHILPRENE 1503	PHILPRENE 1601 PHILPRENE 1605
COLD OIL	PHILPRENE 1703 PHILPRENE 1706 PHILPRENE 1708 PHILPRENE 1712	PHILPRENE 1803 PHILPRENE 1805

Philprene rubber is a good mixer with an easy-going disposition! Processing operations are faster, smoother, less worrisome, with Philprene polymers working for you!

Philprene 1009 or Philprene 1605, for example, can help you turn out footwear, coated fabrics, hard rubber, calendered or extruded items with improved physical characteristics and excellent appearance.

Consult your Philprene technical representative to learn which of the many Philprenes will do the best job *for you!*

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PHILLIPS CHEMICAL COMPANY

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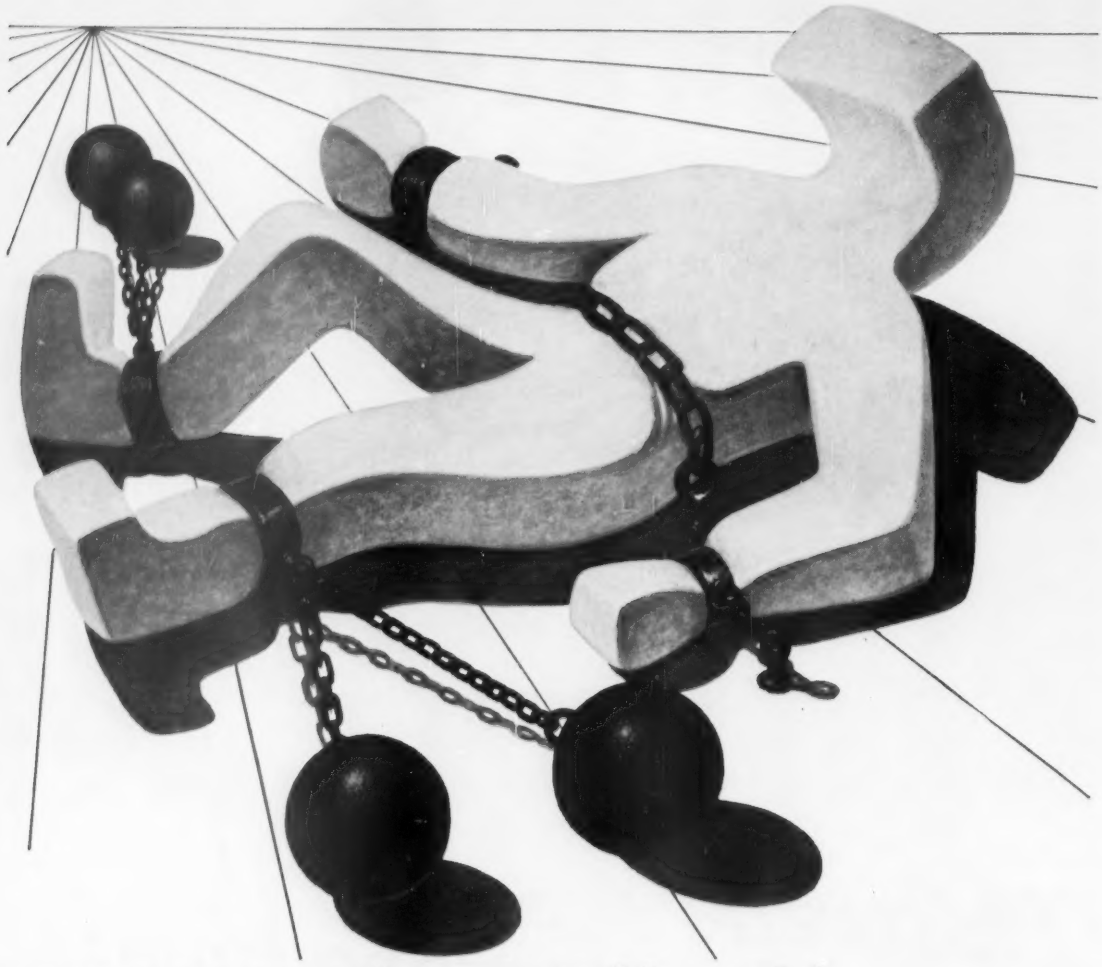


Famous escape artist meets his match

You've seen what often happens to bales of uncured synthetic rubber during shipment and storage. Subject to a condition called "cold flow," the uncured product was once an incorrigible "escape artist." It flowed, settled and burst from ordinary packages. Escaped rubber stuck to bits of cardboard, paper and dirt. Once contaminated, it was difficult to process the rubber into quality products.

Shell Chemical has solved this "sticky" problem—by caging 42 film-wrapped bales of synthetic rubber in a strong, lightweight, steel-strapped wooden container of unique design called the Flotainer*.

Completely new in principle, the Flotainer keeps rubber in check, prevents contamination, reduces waste, speeds handling, and lets you store 20 tons of rubber on less than 100 sq. ft. of floor space.

Leadership in packaging and delivery, plus versatility of product are qualities that customers have learned to expect from Shell Chemical. In addition—a specialized research and development organization devoted to general-purpose synthetic rubber assures prompt, dependable technical assistance.

**Flotainer* is a Shell Chemical Trademark.*

SHELL CHEMICAL CORPORATION
Synthetic Rubber Sales Division
P. O. Box 216, Torrance, California

Fill out and mail this coupon for a complete description of the Flotainer—plus a catalog of Shell synthetic rubbers and latices.

Name_____

Title_____

Company_____

Address_____

SHELL

Capitol Cues

INFLATION IS NOW THE BIG WORRY of government officials and business economists—in contrast to three months ago when fear of a slump was very widespread. It's a new kind of inflation: Recovery has only just started and there's plenty of goods about; but money is tighter and the price-wage spiral that began with the war seems to be getting another lease on life.

What makes this inflation so hard to understand—and hard to deal with—is the fact that it's a psychological phenomenon. People have now come to accept steady inflation as a normal part of life; they have seen unions and industry push prices up in bad times and good. So even a slight business pick-up sets off inflationary fears. Then there's a flight from the dollar—a preference for <u>things</u> that pushes prices up and up.

Already, psychology has pushed many stock prices up to record levels, and made industry less fearful of marking up steel, aluminum, and cloth prices. Unions now hint that they'll ask bigger wage increases to make up for recession marking-time.

THE INFLATION PRESENTS BIG PROBLEMS for individuals and government. They must decide whether it is only a temporary thing—likely to dissipate in a little while when the psychology changes—or the start of a long-term uptrend. At stake are the businessman's profits for perhaps several years to come...the investor's nest egg...and the economy's over-all stability.

- <u>Business</u> must choose between plunging ahead on inventory or bigger plant—or waiting to see if the inflation will wane. (Most economists feel this is a time to be long, not short.)
- <u>Investors</u> must chose to buy stocks or real estate now or hold devaluing cash, waiting for a shakeout that may never come. (If you can wait for growth, even high prices will pay off.)

NEW STEPS TO TIGHTEN CREDIT are on the way. Officials are watching things closely—making policy day by day, as inflation developments dictate. Chances are they'll raise the official discount rate again—maybe to 2½%. (This is the rate that banks pay when <u>they</u> borrow from the Federal Reserve, and it was already raised once, in mid-Summer.) The Reserve will take steps to see that banks don't get as much new money to lend as they had last year at this time. Before long, interest rates may be back up near 1957's peak.

WATCH EARLY SALES OF 1959 CARS FOR A TIP-OFF as to how fast the rise in business activity will go—and how far inflation fears will be realized. If the new models get a warm reception, then get set for a nice little boom—in appliances and other hard goods, too. If the reception is only luke-warm, then the recovery will still be brisk, though it won't rate the word "boom."

Best forecasts as to the 1959 auto year read like this:

- <u>New cars</u> may hit a 6-million car level, tops. More likely, the figure will be 5.3 to 5.5 million. (1958? 4.3 million.)
- <u>Used cars</u> will be in tight supply, and prices will be firm. Many who might normally buy a new car, will take a used one. .

Continued on Next Page

THIS IS A GOOD TIME TO REVIEW INVENTORY POLICIES, say many business forecasters. In their view, many firms are in danger of being caught short this Fall. Retailers' stocks are, on the whole, slightly lower than a year ago. Manufacturers' holdings of many items are way down, so retailers will have trouble getting delivery on rush orders, if sales pick up. And sales are expected to increase smartly in the final months of this year.

FIRST FORECASTS OF BUSINESS IN 1959, now being made by economists, show a year much better than this one—a year of faster-than-average growth. Virtually all of the things that determine trend will be pluses—government spending...consumer spending, especially for durables...and business outlays for new plant. (This last may ease some early in the year but should be on the rise by the second half.) Some analysts even see the possibility of a new boom, though the only-mediocre prospects for autos weigh against this.

Here are some basic trends foreseen for next year:

- Production will regain 1957's peak levels some time in the course of the year. The gain will be some 7% over today's.
- Employment will run 1.5 million workers higher. The gains will center in construction, retailing, and the services.
- Unemployment will still average 4 million or more. Some 700,000 new workers will replace many of those rehired.
- Wages will increase by more than this year's average of 9¢ an hour. The number of workers benefiting will be up, too.
- Prices will rise 1% to 2%, despite some leveling in food.

Total output of goods and services—Gross National Product—will increase to almost $460 billion in 1959. That will be about 6% greater than the $433 billion expected this year.

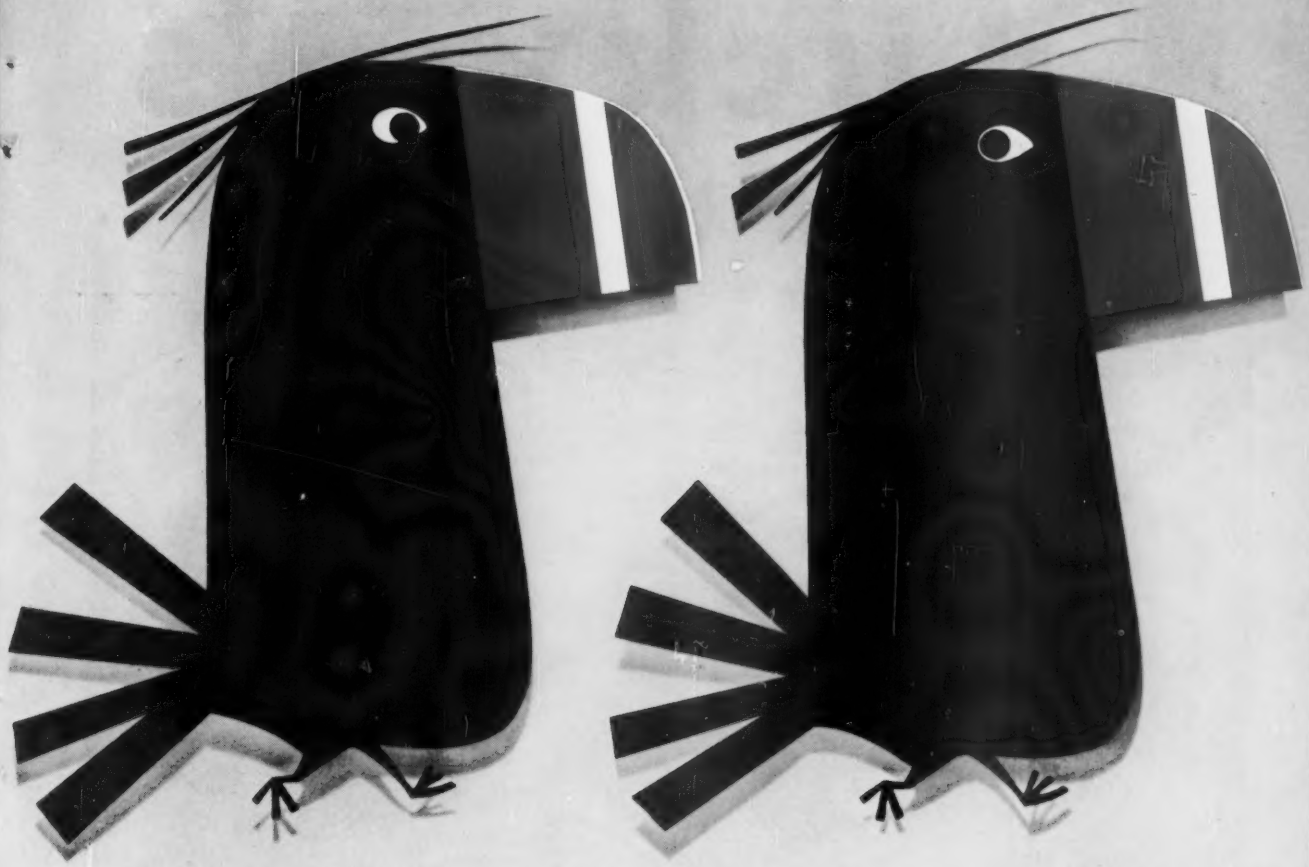
THERE'S STILL HOPE FOR LEGISLATION UNPASSED in the closing days of the past session of Congress. Measures of concern to many industries stand a good chance next year, though they will have to start from scratch, with hearings and committee drafts in both houses before floor votes. Many bills had strong support from lawmakers. But they were blocked by disagreements over details, which couldn't be resolved before adjournment rolled around.

Some of the more likely candidates for passage:

- Labor regulation will be voted with curbs on racketeering—especially if the Senate Committee keeps turning up dirt.
- Mineral subsidies are a good bet. The Administration likes this better than the tariffs and quotas otherwise needed.
- More housing money will be voted, since the various housing agencies are running out. The money stimulates business.
- A minimum wage hike will be pushed again and, in the more liberal atmosphere of 1959, might just make it to $1.25.
- Minor tax changes will deal with excises, loopholes, and a proposal for extending fast depreciation to used equipment.

Some controversial bills probably won't pass in '59, either—school construction, limits on powers of the Supreme Court, and reductions in individual or corporate income tax rates.

Among new business to be taken up next year will be anti-inflation action, a farm law with still lower price props, and development capital for Latin America and the Mid-East.



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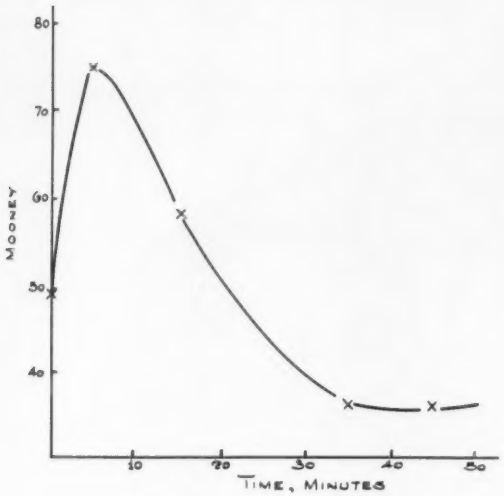
PATENT REVIEW

by Melvin Nord

Heat Processing of Butyl Rubber

U. S. Patent 2,822,342, issued February 4, 1958 to Francis P. Ford and Albert M. Gessler, assigned to Esso Research and Engineering Co., describes a method of preparing carbon black-butyl rubber compositions having improved physical properties. It involves a thermal treatment which is carried out prior to vulcanization.



The process consists of mixing carbon black with a low unsaturation solid olefin-multiolefin synthetic rubbery copolymer and 0.3 to 0.5% of dinitroso compounds, dioximes, or aromatic quinonoid compounds, and subjecting the mixture to a temperature of 360°F. for 30 minutes. Both the stress properties and the elastic properties of the subsequently cured copolymer are improved, and the Mooney value is on the decrease from the maximum. The figure shows representative test results of Mooney viscosity.

Apparatus for Making Corrugated Rubber Tubing

U.S. Patent 2,832,096, issued April 29, 1958 to Vance M. Kramer and Lawrence W. Carlton, describes a process for the making of rubber tubing having a continuous spiral corrugation by a "cording" process, in which a flexible tensile element or cord is wrapped spirally about rubber or other stock carried by an elongated rotatable mandrel. The pressing or squeezing of the stock against the mandrel by the tension in the cord

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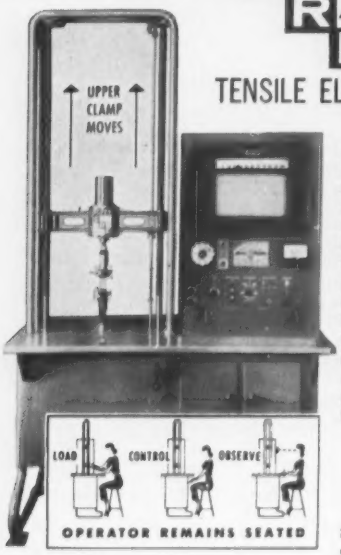

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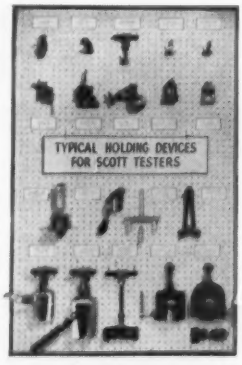

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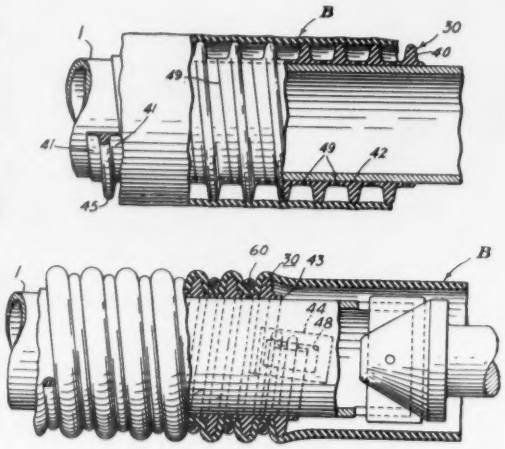
results in the formation of a spiral groove in the stock which is held by the cording element during curing of the tube.

In accordance with this invention, the interior of the corrugated tube is shaped by a contoured internal core piece laid up along the length of and supported by a suitable rigid mandrel, the core piece being wrapped about the mandrel in spiral fashion. The core piece is characterized by a cross sectional shape suitably contoured to mold the internal surface of the tube to a predetermined wave form.



The top of the schematic shows the raw or partly cured cylindrical tube stock blank embracing the mandrel and the flexible core strip after the tube blank has been drawn over the mandrel and core strip preparatory to the "cording" operation. The bottom shows one end of the mandrel and associated components after the completion of the cording step, showing the raw or partly cured rubber tube blank deformed to spiral corrugated shape by and between the core and the cord.

Production of Silicon Monoxide Reinforcing Agent

U.S. Patents 2,823,979 and 2,823,980, issued February 18, 1958 to Daniel S. Sears and assigned to B. F. Goodrich Co., describe continuous processes for preparing a finely-divided fibrous solid silicon monoxide which has a high surface area and is particularly useful as a reinforcing agent for rubber.

It has been found that by contacting gaseous silicon monoxide with an essentially pure inert gas under conditions of lamellar flow, and condensing the monoxide gas in the presence of the inert gas, fibrous, finely-divided solid silicon-

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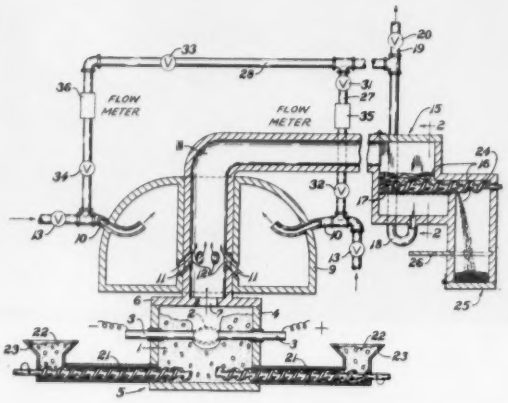
PATENT REVIEW

monoxide compositions having a large surface area are obtained. A minor amount of the composition may consist of spherical particles. Extensive sealing of the apparatus to maintain extremely low pressures or a vacuum is not required as the flowing inert gas tends to keep out the oxygen of the atmosphere. Extra reinforcement to withstand high pressures and the use of cooling water are also not required.

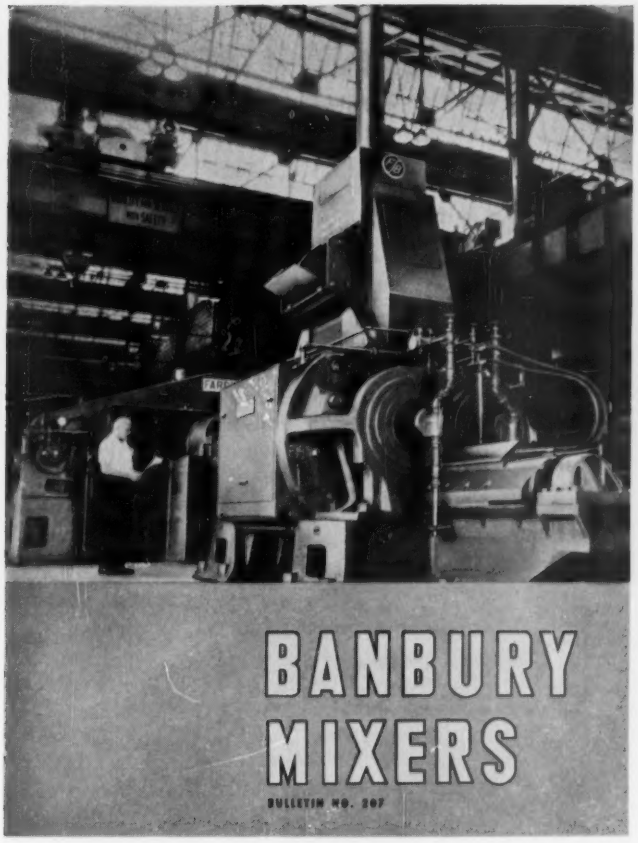


As shown in the illustration, charge 1 of essentially equal moles of silica and carbon is subjected to arc 2 between electrodes 3-3. The reaction which takes place in the furnace is represented as follows:

$$SiO_2 + C \longrightarrow SiO\uparrow + CO\uparrow$$

The top of the furnace contains port 7 through which the silicon monoxide and carbon monoxide gases resulting from the reaction pass to tube 8 surrounded by enclosed chamber 9. The sides of chamber 9 contain inlet tubes 10-10 which permit entry of an inert gas, such as essentially pure nitrogen gas, which fills the chamber uniformly and flows from the chamber by means of ports 11-11 which register with ports 12-12 in the base of the tube 8 to mix with the silicon monoxide and carbon monoxide issuing from the furnace with a minimum of turbulence. Flow regulating valves 13-13 control the entry of the nitrogen into the system. The mixture of gaseous nitrogen, condensed silicon monoxide and carbon monoxide is delivered in collecting chamber 15 where the fibrous product 16 is deposited on screen 17 and the carbon monoxide and nitrogen gases are discharged to the atmosphere by means of pipes 18 and 19 and valve 20, or led to suitable gas collecting apparatus for further use.

As the reaction in the furnace proceeds the coke and silica are consumed, and fresh supplies are introduced by screw conveyors 21-21. They



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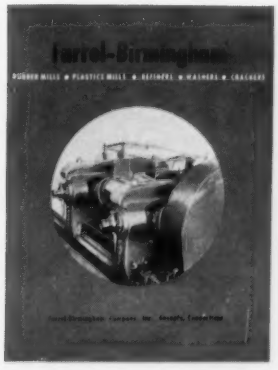

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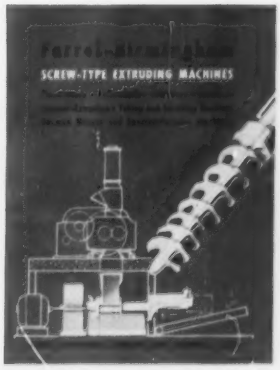

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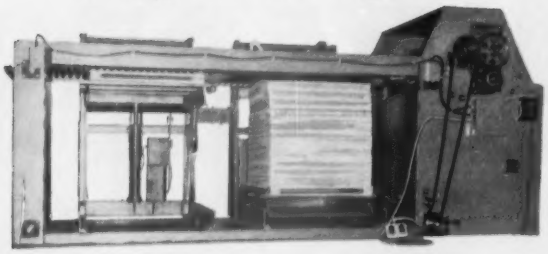
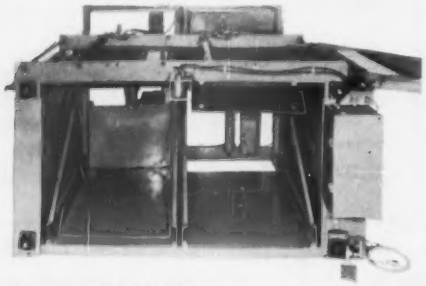


These highly efficient machines are furnished separately or as a complete self-contained unit for automatic cutting and stacking of materials from extruders, mills, calenders, and other processing lines. The Alfa Rotary Cutter is complete with a variable drive for automatic synchronization to the material speed, and length of cut can be easily and infinitely adjusted within the given range. Alfa Stackers are available with single or double stacking units. They accommodate a wide variety of materials and stack on lowering skids that are easily handled by fork truck.



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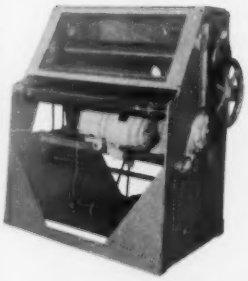

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Representative for Alfa Machine Co.

PATENT REVIEW

deliver a premixed aggregate 22-22 of sand and coke from hoppers 23-23 to the furnace intermittently or continuously as the sand and coke in the furnace proper are consumed and also force the aggregate in the furnace in close proximity to the arc to reduce radiation losses and to provide better reaction. The fibrous silicon monoxide 16 in collector 15 can be withdrawn continuously by means of screw conveyor 24 and deposited in hopper 25 from which it may be removed to storage. Sliding gate 26 is designed to be moved across the interior of the hopper to provide a seal when removing the solid silicon monoxide.

Stabilization of Rubber

U.S. Patent 2,832,753, issued April 29, 1958 to Elliott L. Weinberg and Louis A. Tomka, assigned to Metal & Thermit Corp., discloses a composition for inhibiting damage to rubber by atmospheric ozone, e.g., slight or deep surface cracking.

The invention consists of the incorporation of two types of ingredients into a rubber or elastomer formulation. The first ingredient is an organotin compound such as dibutyltinsulfide or diphenyltinsulfide. The second ingredient is a secondary aryl amine, such as N, N'dibutyl-p-phenylene diamine. The protection afforded by this combination is greater than that afforded by the individual components.

Other Patents Of Interest

Subject	Inventor or Assignee	Patent No.	Date
Tire spraying apparatus	Willi E. Hummel	2,821,130	1/28/58
Transversely-slatted tire tread	General Tire & Rubber Co.	2,821,231	1/28/58
Machine for applying valve bases to inner tubes	United States Rubber Co.	2,821,236	1/28/58
Manufacture of sponge rubber automobile cushions	Commonwealth Engineering Co. of Ohio	2,821,243	1/28/58
Resilient cushion for motor vehicles	General Tire & Rubber Co.	2,821,244	1/28/58

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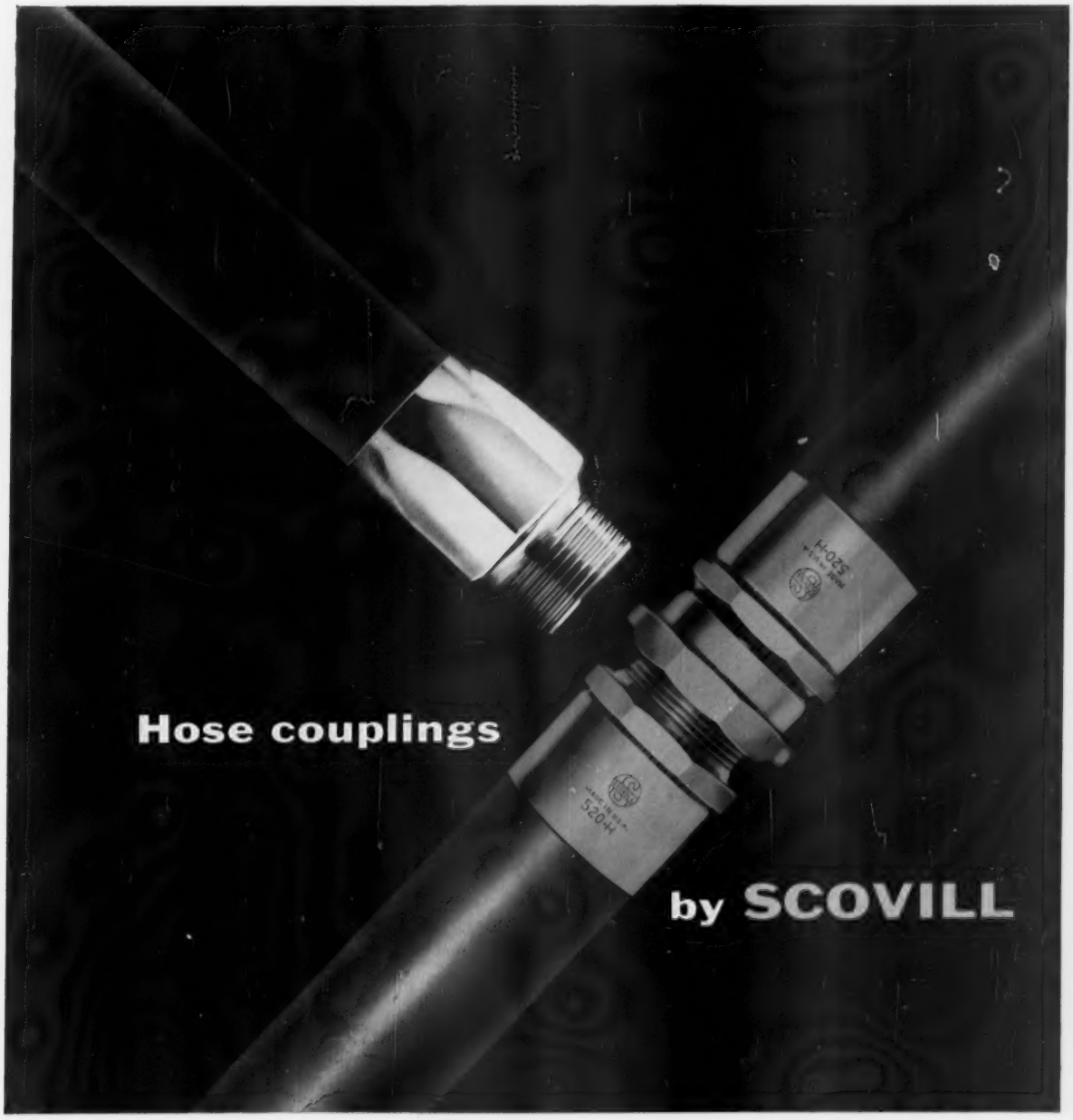

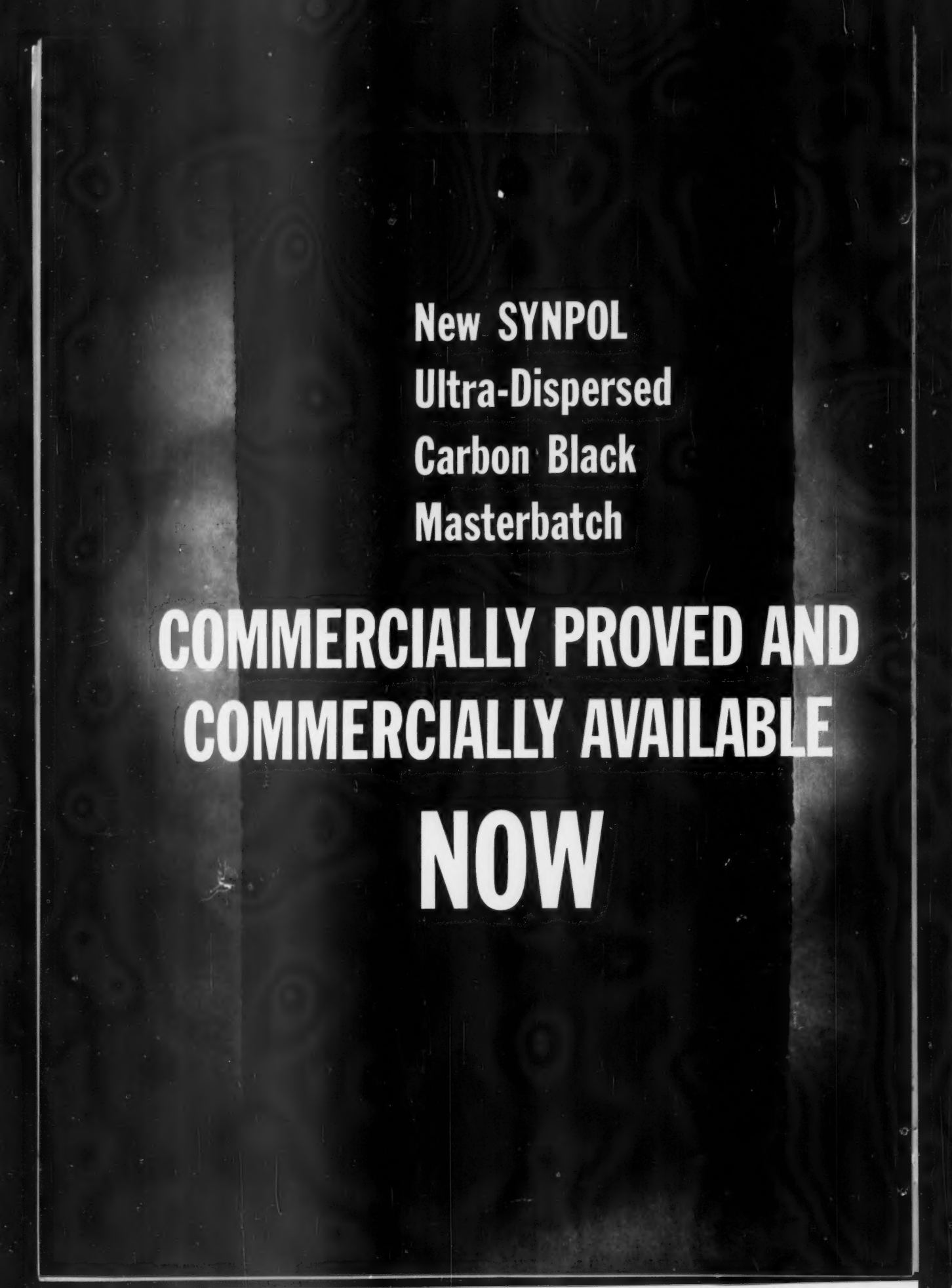
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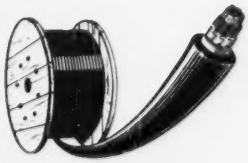

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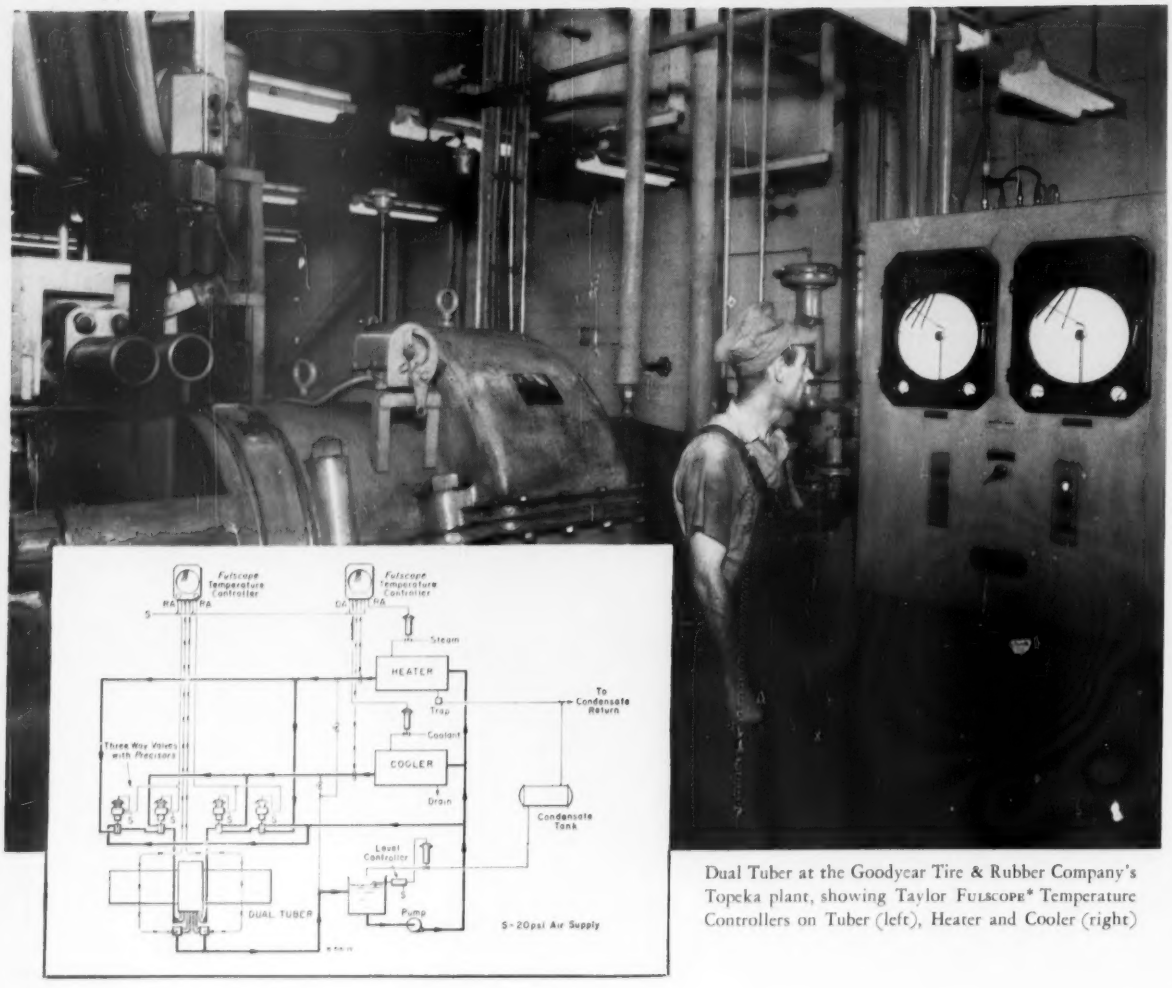


Dual Tuber at the Goodyear Tire & Rubber Company's Topeka plant, showing Taylor FULSCOPE* Temperature Controllers on Tuber (left), Heater and Cooler (right)

GOODYEAR CHOSE *Taylor*

Dual Tuber control system insures a perfectly uniform product regardless of load changes

Of the many methods tried for controlling extruder temperatures, this Taylor system has been proved most satisfactory. It involves circulating a constant volume of liquid at exactly controlled temperatures.

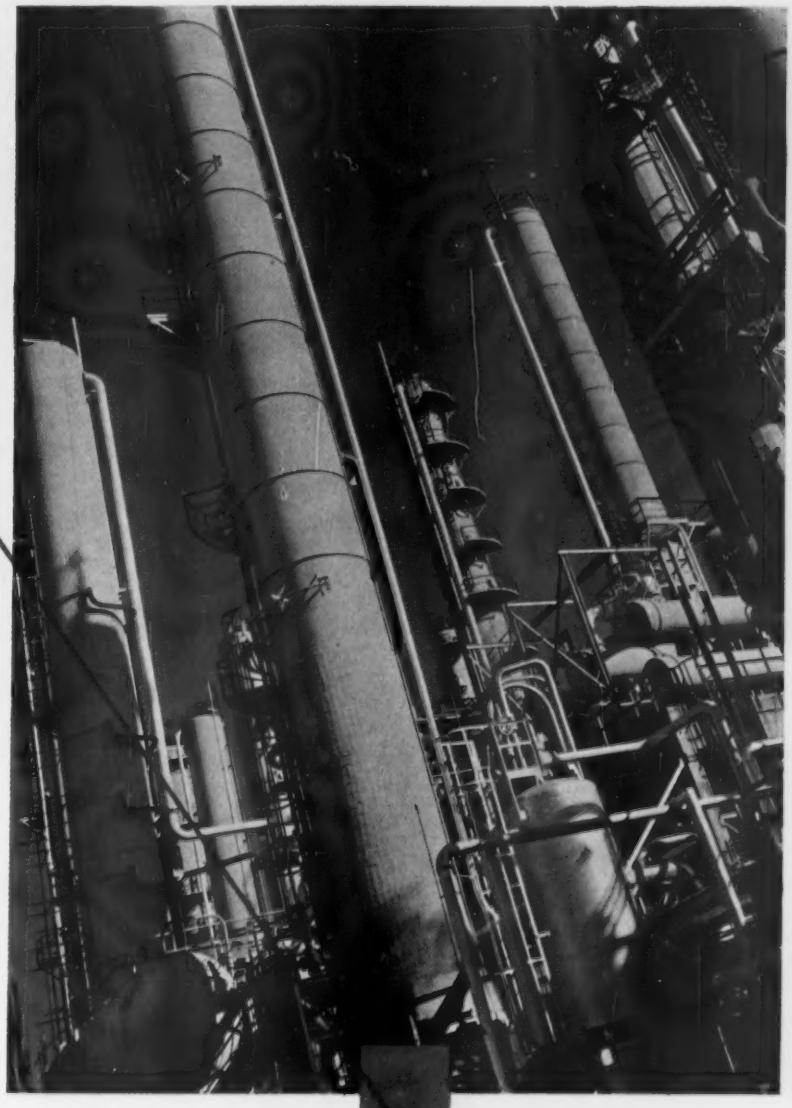
For well over a year it has performed with a high degree of accuracy. Whether you're producing tires or mechanical goods, a Taylor control system will help to maintain uniform quality, reduce operating costs and eliminate the hazards of manual operation. Call your Taylor Field Engineer, or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ontario.

*Reg. U.S. Pat. Off.

Taylor Instruments **MEAN ACCURACY FIRST**

Progress Report from Petro-Tex:

100% More Butadiene
New C_4 Olefins...



A year ago we increased butadiene capacity to 200,000 tons/year and also increased the flexibility of our plant to produce butane-based olefins not previously available in the same grades and quantities.

Currently, we have very substantial continuous production at attractive prices on

BUTADIENE

DIISOBUTYLENE

TRIISOBUTYLENE

n-BUTENE 1
($CH = CH - CH_2 - CH_3$)
95% minimum purity

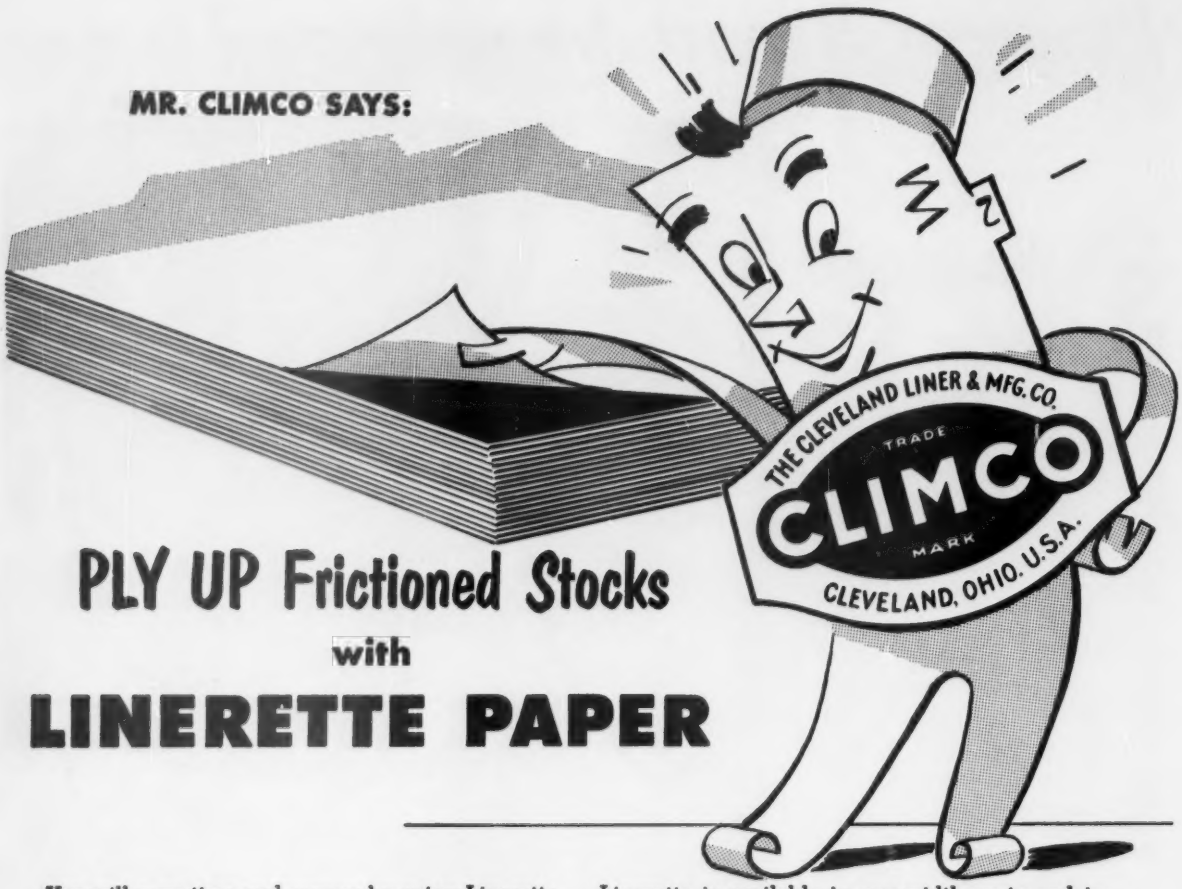
n-BUTENE 2
($CH_3 - CH = CH - CH_3$)
95% minimum purity

We invite inquiries for domestic tank-car and overseas ocean-tanker shipments of these C_4 hydrocarbons. We also will welcome discussion of commercial-volume production of other related petrochemicals.

Petro-Tex®

PETRO-TEX CHEMICAL CORPORATION
HOUSTON 1, TEXAS
JOINTLY OWNED BY
TENNESSEE GAS TRANSMISSION COMPANY AND FOOD MACHINERY AND CHEMICAL CORPORATION

MR. CLIMCO SAYS:



PLY UP Frictioned Stocks with LINERETTE PAPER

You will save time and money by using Linerette separating paper to ply up frictioned stock before cutting in the clicking operation. Frictioned stock can be fed from the calender right into Linerette. This specially processed paper contains no oil or wax, prevents adhesion and insures fast, clean separation . . . leaves no cloth marks.

OTHER LINERETTE ADVANTAGES:

- **Preserves tack.**
- **Protects lightweight stocks in shipment—no fabric needed.**
- **Clippings may be mixed with scrap and worked away when used in die-cutting operations.**
- **Where cleanliness is essential, use Linerette as a low cost lining for trays and containers.**
- **Used in rolls or sheets with most types of lightweight stocks.**

Linerette is available in any width up to and including 54″, in rolls of 9″, 11½″, 13″ and 15″ diameters, on cores of 3″ i. d. The yield is approximately six square yards to the pound. A 9″ roll contains approximately 375 linear yards and a 15″ diameter approximately 1150 linear yards. *Ask for a sample today, just specify desired width.*

THE CLEVELAND LINER & MFG. CO.
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GET THE FULL STORY ON CLIMCO PROCESSING

Illustrated booklet tells about Climco Liners and Linerette separating paper. Tells how to get better service from liners. Write for your copy now.

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Treatment Contains
NO OIL OR WAX
Samples on Request

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PROCESSED LINERS
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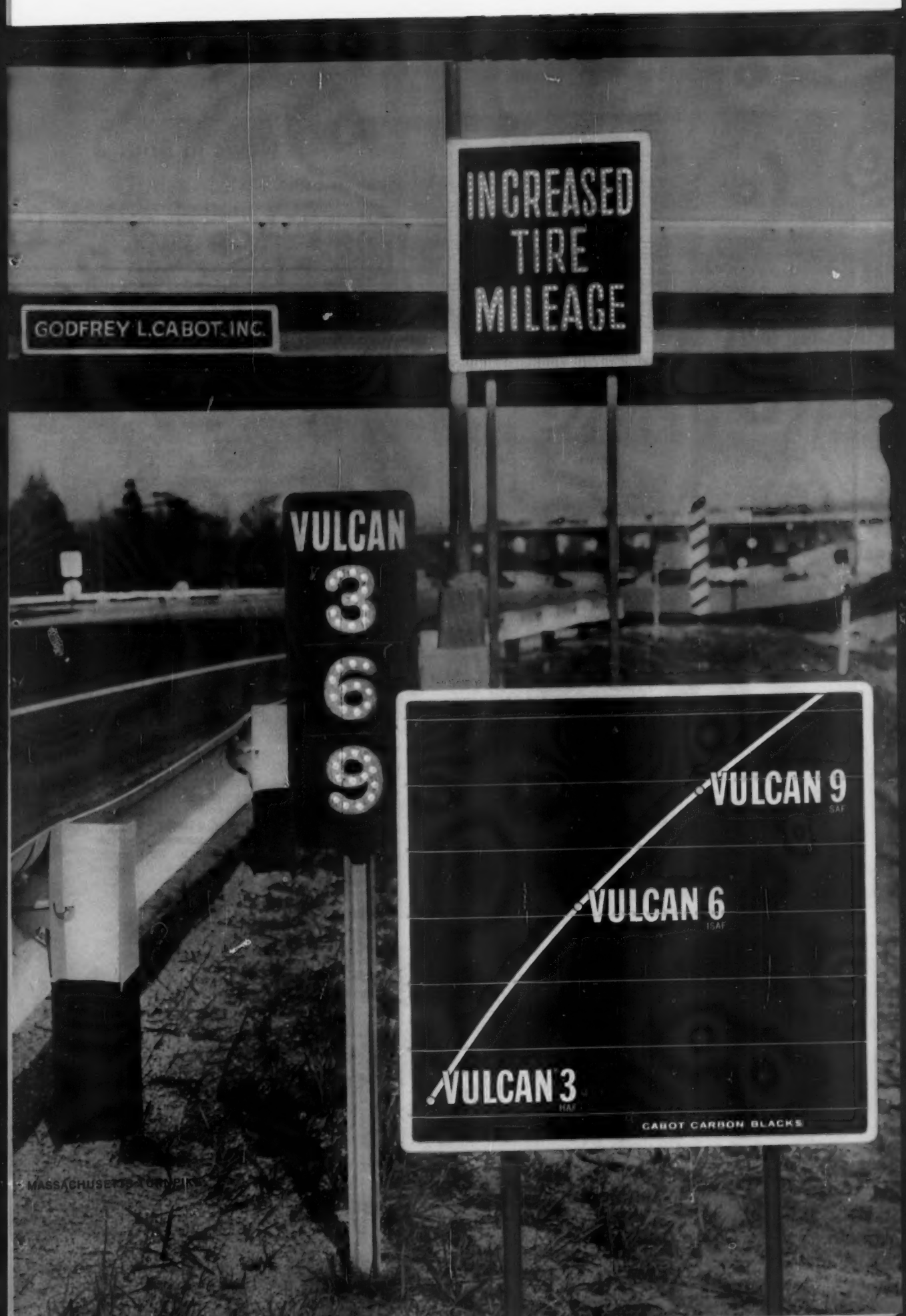
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MODERN DESIGN MOLD CORE PINS

Specially Engineered for Foam Rubber Applications

- **Developed by American Extrusion Corporation (Division of A. H. Wirz, Inc.) Job-proven by leading Foam Rubber Manufacturers**
- **Reduce costly rubber content in mattresses, pillows, etc.**
- **Strip more easily to reduce tearing**
- **Impact extruded *hollow* aluminum construction**
- **All standard diameters available**
- **Wide range of pin lengths**

Let a qualified representative show you how to cut down costly foam rubber content . . . maintain high production and quality with new aluminum hollow foam rubber core pins. Contact American Extrusion Corporation today.

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News in Brief

► Jennings Machine Corp., Philadelphia, Penna., has published a four-page bulletin entitled "World's Fastest Wire Cutting and Stripping Machine" that describes the Acme Wire Cutter and Stripper, which is capable of handling up to 9,000 pieces per hour and wire lengths up to 120 inches long.

► Enjay Co., Inc., New York, has published an eight-page bulletin entitled "Accelerated Ozone Aging", by W. L. Dunkel and R. R. Phelan. This article originally appeared in RUBBER AGE.

► The 1958 edition of "Accident Facts", a statistical yearbook containing facts and figures on all types of industrial, traffic, motor transportation, home, farm and school accidents, has been published by the National Safety Council, Chicago, Ill. The Council also has released a fire prevention pamphlet entitled "Don't Be Alarmed."

► A recent addition to the ceramic magnet separation equipment manufactured by Stearns Magnetic Products, Milwaukee, Wisc., is the "Indox V Drum Separator" for continuous and automatic removal of tramp iron in process industries.

► Automobile Manufacturers Association has published the 1958 edition of "Motor Truck Facts," a 56-page statistical handbook containing information on such subjects as truck production, sales and registrations, truck uses, highways and employment.

► A 16-page brochure entitled "Vacuum Metallizing Coatings for Metal, Glass & Thermosetting Plastics" that describes various coating application procedures as well as the coatings used in conjunction with vacuum metallizing has been published by the Bee Chemical Co., Chicago, Ill.

► E. I. du Pont de Nemours & Co., Wilmington, Del., has published a four-page pamphlet entitled "Ozone Attack: Cause and Cure" which deals with severe ozone problems. "Announcing Viton" is the subject of another pamphlet released by DuPont.

► Detroit Rubber Co., Detroit, Mich., has published an "Elastomer Guide" which offers complete information on natural and synthetic rubbers.

► A new technical bulletin on "Vinyl Plasticizers" that gives detailed data on properties, performance characteristics and recommended uses for monomeric epoxy plasticizers has been released by Argus Chemical Corp., Brooklyn, N. Y. Argus also has issued a 23-page bulletin on the stabilization of polyvinyl chloride.

Made by the originators of custom-blended Sunoco gasolines . . .

Sunoco's "Custom-Made" Process Oils Ease Problems Of Quality Control

Sun Oil Company custom-refines *seventeen narrow-specification* Rubber Process Oils for the rubber industry. Each one is designed to fit a special need for product quality or economy.

THE TABLE ON THE RIGHT gives some facts about six of Sun's most widely used Rubber Oils. Others, not listed, include a series of paraffin oils with low aromatic content; naphthenic oils with moderate aromatic content; and Sundex oils with high aromatic content.

IF YOU PROCESS	USE	BECAUSE
Light-colored oil-extended polymers (1703, 1708, etc.)	**CIRCOSOL® NS**	It combines superior nonstaining characteristics with best processibility, imparts good physicals. Primarily an extender.
Oil-extended polymers (1703, 1708, etc.)	**CIRCOSOL 2XH**	It's a general-purpose softener and extender for light-colored rubber goods, especially where optimum physicals are required.
Regular neoprenes, natural rubber, Hypalon (where color is a problem)	**CIRCO® LIGHT**	It's an ideal all-around moderate-priced plasticizer for nonstaining reclaims and butyl inner tubes, SBR, GN, W, WRT.
Oil-extended polymers (1705, 1710, etc.) and natural rubber, Hypalon (where color is no problem)	**SUNDEX® 53**	It's a double-distilled aromatic plasticizer for tire-tread stock, rubber footwear, matting, toys, semi-hard rubbers, high-Mooney WHV.
Black master-batch polymers 1706, 1711, 1712, etc.	**SUNDEX 1585**	It's a new highly aromatic plasticizer for tough polymers where easy processing is desired. This is a distilled process aid.
Natural rubber, SBR polymers, regular and WHV neoprenes, acrylonitrile polymers	**SUNDEX 85**	It's especially recommended for very high loadings of WHV neoprene (from 75 to over 100 parts Sundex 85 to 100 parts polymer). Used in hard rubber goods.

- To help you select the correct oil for your individual needs Sun has just published a new brochure: "A GRAPHIC METHOD FOR SELECTING OILS USED IN COMPOUNDING AND EXTENDING BUTADIENE-STYRENE RUBBERS."

  Get a copy from your Sun man or write Dept. RA-10.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

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Can you improve a GRS compound with one of these resins?

If you are interested in upgrading the properties of GRS compounded stocks, you may find one of these Durez phenolic resins useful.

They serve as effective plasticizers during processing, and also contribute materially to hardness, stiffness or boardiness, and abrasion resistance. These properties are of particular interest for such applications as shoe soles, top lifts, and tire beads.

Generally only 5 to 10 parts of resin per 100 parts of GRS will produce, with normal loading, Shore A hardness of 90 to 100.

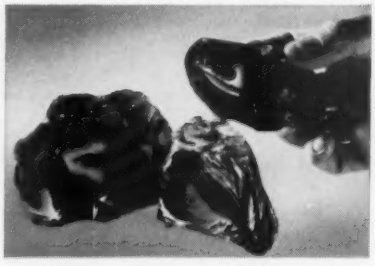
Since the resins are thermosetting, the qualities they impart are retained at elevated temperatures. This constitutes a major advantage of phenolic resins over thermoplastic materials sometimes used to increase hardness and stiffness.

Compatibility • Phenolic resins do not have complete compatibility and reactivity with GRS as they do with nitrile-type rubbers. However, you can greatly increase compatibility by using some nitrile rubber in the formulation, serving as a common solvent or flux. This procedure greatly improves over-all physical properties of the vulcanized material.

For use in GRS compounded stocks, we recommend the following resins:

12687 powdered resin • This resin is used only in those instances where nitrile rubber is used as the common solvent or flux. It is more compatible with nitrile rubber than are the other resins recommended for use with GRS.

13355 powdered resin • This resin is most generally used with GRS. It is lighter in color than 12687 and more effective, when used without nitrile rubber, in increasing hardness and stiffness. It is suitable for so-called "light oak" shoe soling.



13349 lump resin • This is the base resin used in producing 13355. In this form, it is entirely thermoplastic and is safe for use where high processing temperatures are encountered, as in Banbury mixing. It requires addition of 8% hexamethylenetetramine to make it properly thermosetting and give properties equivalent to 13355. The hexa is added either at the last stage of Banbury or on the warm-up mill.

Where else can Durez resins help you get properties you want?

Nitrile rubber compounds • Completely compatible with nitrile rubbers, Durez resins soften and plasticize the stock, then aid vulcanization with substantial gains in strength, hardness, stiffness, abrasion resistance, heat and chemical resistance of the final cured stock. Compatibility and reactivity increase with increasing nitrile content.

Solvent-type adhesives • You can produce excellent adhesives using Durez resins with nitrile rubber, natural rubber, and Neoprene. Durez resins have been used successfully as an adhesive for bonding uncured and cured nitrile rubber stocks to various metals during molding.

Synthetic rubber latices • A highly effective means of hardening and reinforcing nitrile rubber latices is the use of Durez resin emulsions developed for this purpose. For modifying the properties of latex-treated papers, a water-soluble liquid resin is available. So far, the use of these resins is confined mainly to nitrile rubber latices. However, one Durez resin has produced very satisfactory results with certain high-styrene-butadiene latices.

For a more complete description of the application of Durez resins in compounding, in solvent cements, and in modification of latices, write for the illustrated bulletin, "Durez Resins in the Rubber Industry."

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PLASTICS DIVISION

HOOKER CHEMICAL CORPORATION

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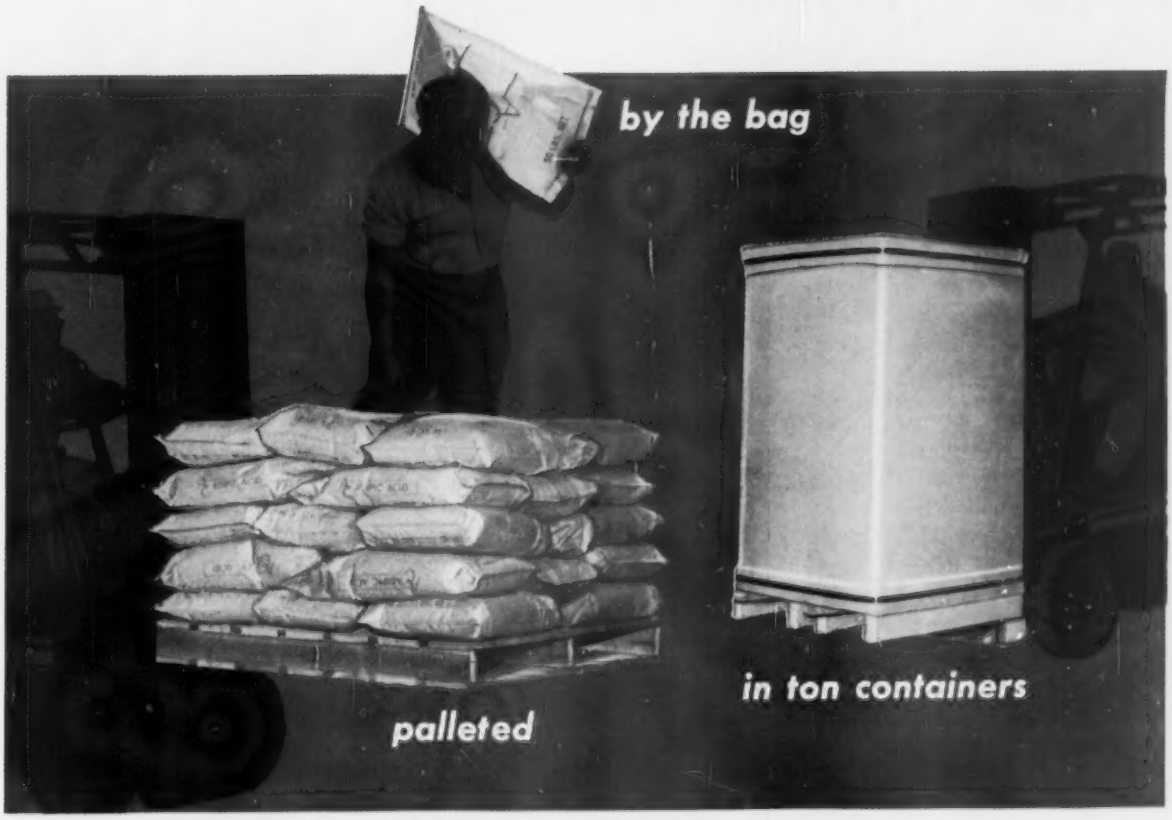
National® ADIPIC ACID?



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Production by our direct, continuous process is completely integrated within the Allied Chemical group. Quality is unsurpassed . . . 99.8% minimum purity, light in color and low in moisture, iron and volatile acids.

Adipic acid has broad application in the manufacture of plasticizers (particularly for low temperature use), polyester resins for urethane foams, synthetic lubricants, fibers, elastomers, alkyd resins, etc. It shows excellent promise in a variety of other uses as well.

If you use adipic acid or have a potential interest in it, we will be glad to send you a sample and copy of our newly revised Technical Bulletin I-12R.

Allied Chemical

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How to Protect Product Quality

High-speed operations in the rubber industry require fast, accurate control of tensions. Improper speed matching can ruin the product in process. To help protect product quality, General Electric has designed a new packaged, adjustable-speed drive—the Speed Variator.

Operating from an a-c power source, the Speed Variator provides accurate control of drive speeds over an infinite range.

To find out how this flexible new drive can help you meet today's fast changing process demands, call your General Electric Sales Engineer, or write for GEA-6643. *Direct Current Motor & Generator Department, Erie, Pennsylvania.* 813-22

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GENERAL ELECTRIC

COMING EVENTS

Oct. 16. Boston Rubber Group, Fall Meeting, Hotel Somerset, Boston, Mass.

Oct. 17. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Oct. 17-18. Southern Rubber Group, Roosevelt Hotel, New Orleans, La.

Oct. 20. Washington Rubber Group, Kick-off Meeting, Touchdown Club, Washington, D. C.

Oct. 24. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Oct. 24. Akron Rubber Group, Sheraton Hotel, Akron, Ohio.

Nov. 3. Washington Rubber Group, Field Trip, Western Electric Wire & Cable Co., Baltimore, Md.

Nov. 4. Los Angeles Rubber Group, Biltmore Hotel, Los Angeles, Calif.

Nov 6. Rhode Island Rubber Club.

Nov. 13. Northern California Rubber Group.

Nov. 14. Chicago Rubber Group.

Nov. 14. Connecticut Rubber Group.

Nov. 14. Philadelphia Rubber Group, Fall Dance, Manufacturers Golf and Country Club, Oreland, Penna.

Nov. 17-21. Society of the Plastics Industry Annual National Conference, Morrison Hotel, Chicago, Ill.

Nov. 30-Dec. 5. A.S.M.E. Annual Meeting, Hotel Statler, New York, N. Y.

Dec. 2. Buffalo Rubber Group, Xmas Party.

Dec. 2-4. Seventh Annual Wire and Cable Symposium, Berkeley-Carteret Hotel, Asbury Park, N. J.

Dec. 4. Fort Wayne Rubber & Plastics Group, Van Orman Hotel, Fort Wayne, Ind.

Dec. 5. Detroit Rubber & Plastics Group, Xmas Party, Statler-Hilton Hotel, Detroit, Mich.

Dec. 9. Buffalo Rubber Group, Xmas Party, Buffalo Trap & Field Club.

Dec. 12. New York Rubber Group, Xmas Party.

Dec. 12. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 13. Southern Ohio Rubber Group, Winter Meeting, Miami Valley Country Club, Dayton, Ohio.

Jan. 23, 1959. Akron Rubber Group, Sheraton Hotel, Akron, Ohio.

Jan. 23, 1959. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Jan. 30-31, 1959. Southern Rubber Group, Statler Hotel, Dallas, Texas.

Feb. 2, 1959. Washington Rubber Group, Army-Navy Club, Washington, D. C.

Feb. 3, 1959. Los Angeles Rubber Group, Biltmore Hotel, Los Angeles, Calif.

Feb. 4-6, 1959. American Society for Testing Materials, Committee D-11, Pittsburgh, Penna.

Feb. 12, 1959. Fort Wayne Rubber & Plastics Group, Winter Meeting, Van Orman Hotel, Fort Wayne, Ind.

March 3, 1959. Buffalo Rubber Group Spring Meeting, Hotel Westbrook, Buffalo, N. Y.

March 20, 1959. New York Rubber Group, Technical Meeting, Henry Hudson Hotel, New York, N. Y.

April 3, 1959. Akron Rubber Gorup, Sheraton Hotel, Akron, Ohio.

April 16, 1959. Fort Wayne Rubber & Plastics Group, Spring Meeting, Van Orman Hotel, Fort Wayne, Ind.

May 1, 1959. Joint International Meeting, Buffalo Rubber Group-Ontario Rubber Section, C.I.C., Hotel Sheraton Brock, Niagara Falls, Ont.

May 12-15, 1959. Division of Rubber Chemistry, A.C.S., Spring Meeting, Biltmore Hotel, Los Angeles, Calif.

June 4, 1959. New York Rubber Group, Summer Outing.

June 9, 1959. Buffalo Rubber Group, Golf Outing, Lancaster Country Club.

Aug. 4, 1959. New York Rubber Group, Golf Tournament.

Oct. 13, 1959. Buffalo Rubber Group, Fall Meeting, Hotel Westbrook, Buffalo, N. Y.

Oct. 16, 1959. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Nov. 9-13, 1959. Joint International Meeting of Division of Rubber Chemistry, A.C.S.; Committee D-11, A.S.T.M., and Rubber and Plastics Division, A.S.M.E., Shoreham Hotel, Washington, D. C.

Dec. 18, 1959. New York Rubber Group, Xmas Party.

May 24-27, 1960. Division of Rubber Chemistry, A.C.S., Spring Meeting, Statler Hotel, Buffalo, N. Y.

Sept. 13-16, 1960. Division of Rubber Chemistry, A.C.S., Fall Meeting, Commodore Hotel, New York, N. Y.

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New General Electric Speed Variator

1. Amplistat Regulator offers better speed regulation and adjustable, timed acceleration for improved product quality.

2. Static Exciter, with silicon rectifier, has no moving parts, requires no warm-up, provides more production time, less maintenance.

3. Two-Unit, Four-Bearing M-G Set features Tri-Clad† '55' motor for more dependable performance.

4. Front-Connected Controls, recessed wiring troughs make routine inspection easy, cut maintenance time.

5. Kinamatic* Drive-Motors have field coils encapsulated for longer life. For details on this dependable motor see next page.

For more information contact your Apparatus Sales Office or write for GEA-6643. *Direct Current Motor & Generator Department, Erie, Pennsylvania.*

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NEW GENERAL ELECTRIC DC MOTOR HAS

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KINAMATIC* *. . . a new standard in industrial direct-current motors* . . . designed to give extra dependability to automated production systems.

Encapsulated Field Coils . . . insulated with mica and glass and permanently sealed against moisture and corrosive airborne materials . . . virtually eliminates insulation as an element in motor life and adds a reliability factor never before available in a standard direct-current motor.

Greater Versatility . . . a 15% service factor now available in the standard, dripproof d-c Kinamatic motor means user can: 1) obtain 15% more than rated power for normal life of motor; 2) obtain 100% longer motor life at rated power; or, 3) obtain greater versatility on speed and horsepower duty cycles.

Additional information is available at your nearest General Electric Apparatus Sales Office. Or, write for Bulletin GEA-6355. *Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.*

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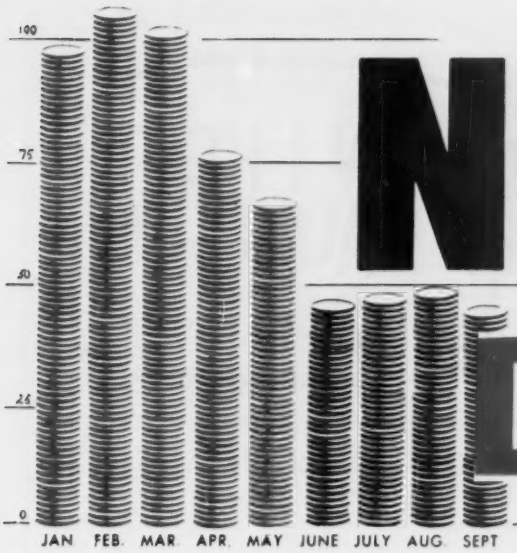

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POLYMEL RC 57

CUTS PRODUCTION COSTS! SAVES SCRAP! SAVES WASTE!

PROCESSES · PLASTICIZES · SALVAGES

A free flowing material that salvages scrap and waste rubber

Tackifies batches too dry to handle on the mill.

FOR SCORCHED NEOPRENE, GRS, BUNA-N OR NATURAL RUBBER

Use from 3 to 10% depending upon condition of stock. In high loadings less Polymel RC 57 is needed than in low.

SALVAGING MOLD TRIM

Put the mold trim on a tight mill and add slowly 8 to 10% Polymel RC 57 to the shredded trim. Mill together until mass is homogenous. When mixing a new batch of same material, add 10% of the reclaimed trim. There will be no change in the hardness or time of cure of the new batch.

PRICES

32c a lb.— 1 drum to 5000 lbs.
31c a lb.— 5000 lbs. to truckload
30c a lb.— truckload

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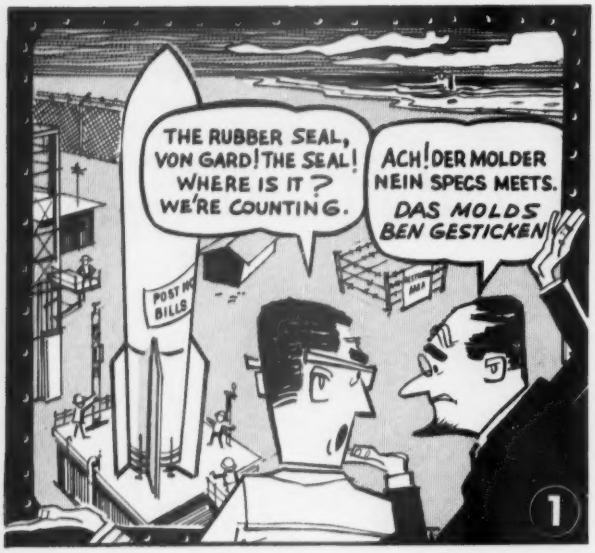
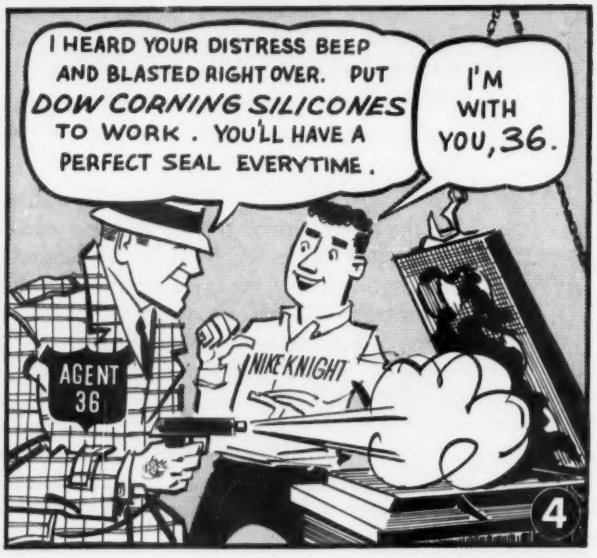
AGENT 36
SILICONE SQUAD

HOW I KEPT A LAUNCHIN' DATE

FROM THE OFFICIAL FILES OF DOW CORNING

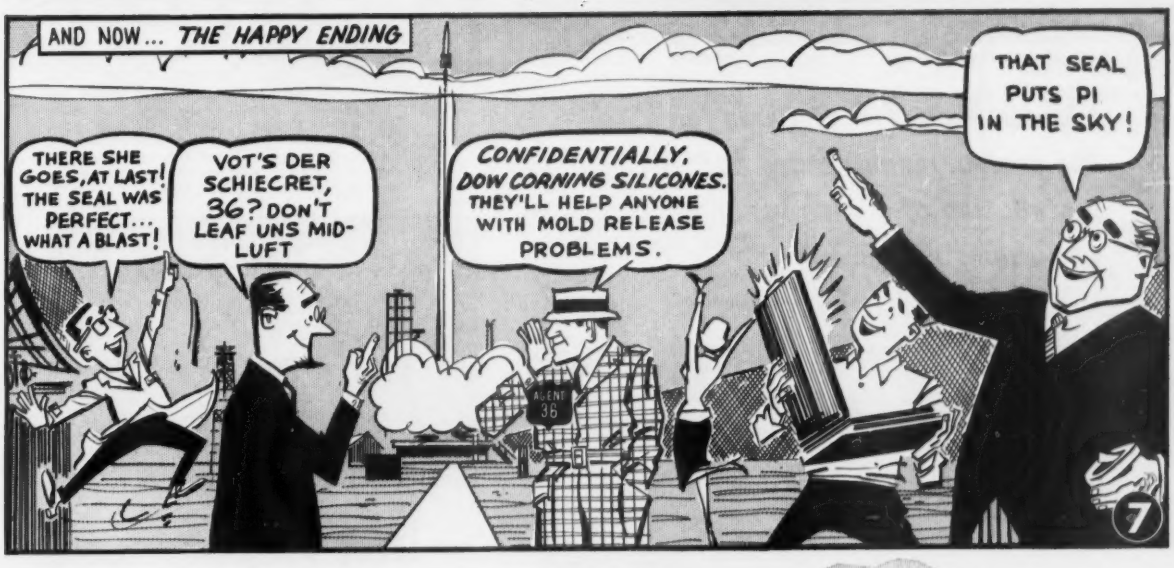

THE RUBBER SEAL, VON GARD! THE SEAL! WHERE IS IT? WE'RE COUNTING.
ACH! DER MOLDER NEIN SPECS MEETS. DAS MOLDS BEN GESTICKEN
POST NO BILLS
1

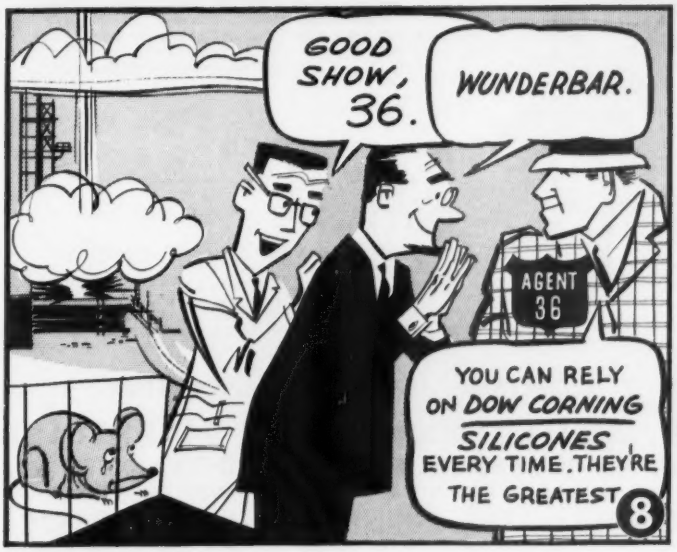
MEANWHILE, BACK AT THE PLANT...
ANOTHER NO GOODNIK!
WE'VE HAD IT. LET'S GO BACK TO MAKING JAR RUBBERS.
OVER MY DEAD DAGUERREOTYPE.
2


I HEARD YOUR DISTRESS BEEP AND BLASTED RIGHT OVER. PUT DOW CORNING SILICONES TO WORK. YOU'LL HAVE A PERFECT SEAL EVERYTIME.
I'M WITH YOU, 36.
AGENT 36
NIKE KNIGHT
4

THE DIFFERENCE IS DOW CORNING 36 EMULSION! MOLDS RELEASE EASILY... GIVE SHARP SURFACE DETAIL. YOU REDUCE SCRAP, SPEED PRODUCTION, CUT MOLD CLEANING TIME, SAVE MONEY. ALL THAT!
OUR FOUNDER
AGENT 36
BY GEORGE, I THINK WE'VE GOT IT!
YOU'RE A DOLL, 36.
5

MEANWHILE, BACK AT THE LAUNCHING PAD...
STILL SANS SEAL? WE'LL NEVER ORBIT, ALBERT.
VOT A BUST. VOT A VASTE!
LISTEN! THEY'RE PLAYING OUR SONG.
YES, "HOW HIGH THE CHEESE"
6


AND NOW... THE HAPPY ENDING
THERE SHE GOES, AT LAST! THE SEAL WAS PERFECT... WHAT A BLAST!
VOT'S DER SCHIECRET, 36? DON'T LEAF UNS MID-LUFT
CONFIDENTIALLY, DOW CORNING SILICONES. THEY'LL HELP ANYONE WITH MOLD RELEASE PROBLEMS.
THAT SEAL PUTS PI IN THE SKY!
AGENT 36
7



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MIDLAND, MICHIGAN

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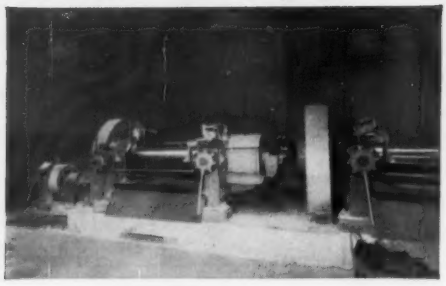

TWO-ROLL MIXING MILL For the efficient mixing and warming of all thermoplastic-thermosetting materials Shaw produce a range of mills from 13" x 16" up to 84" x 26". Supplied in batteries or with individual drives, these machines are capable of high sustained output. Single or double geared models available. The machine shown is fitted with Lunn Safety Gear.

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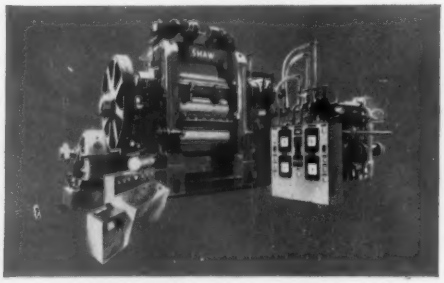

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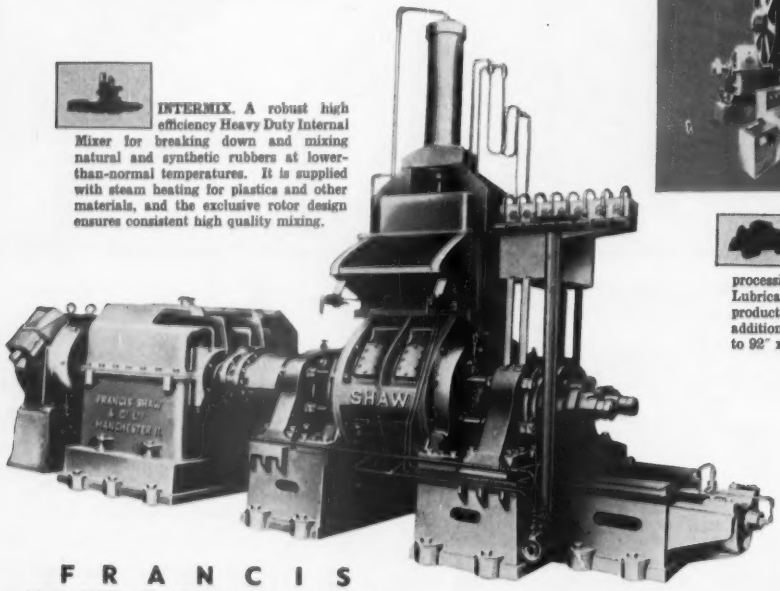

CALENDER. A comprehensive range of Francis Shaw Calenders is available for the processing of all rubber and plastic materials. Flood Lubrication and hydraulic roll balancing available on all production sizes. Roll Bending can be fitted as an additional refinement. All sizes available from 13" x 6" to 92" x 32". Two-, Three, and Four-Bowl Designs.

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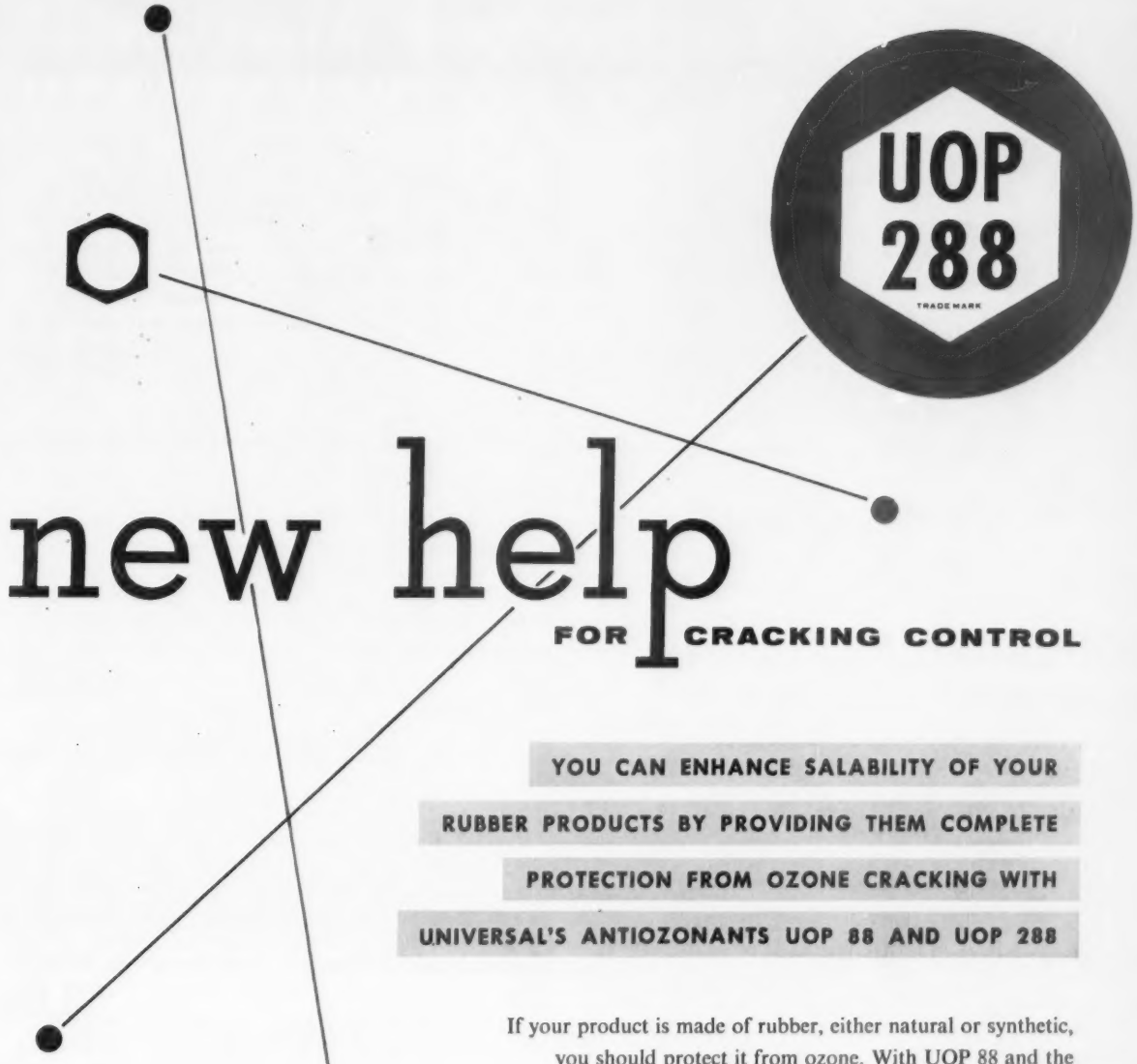

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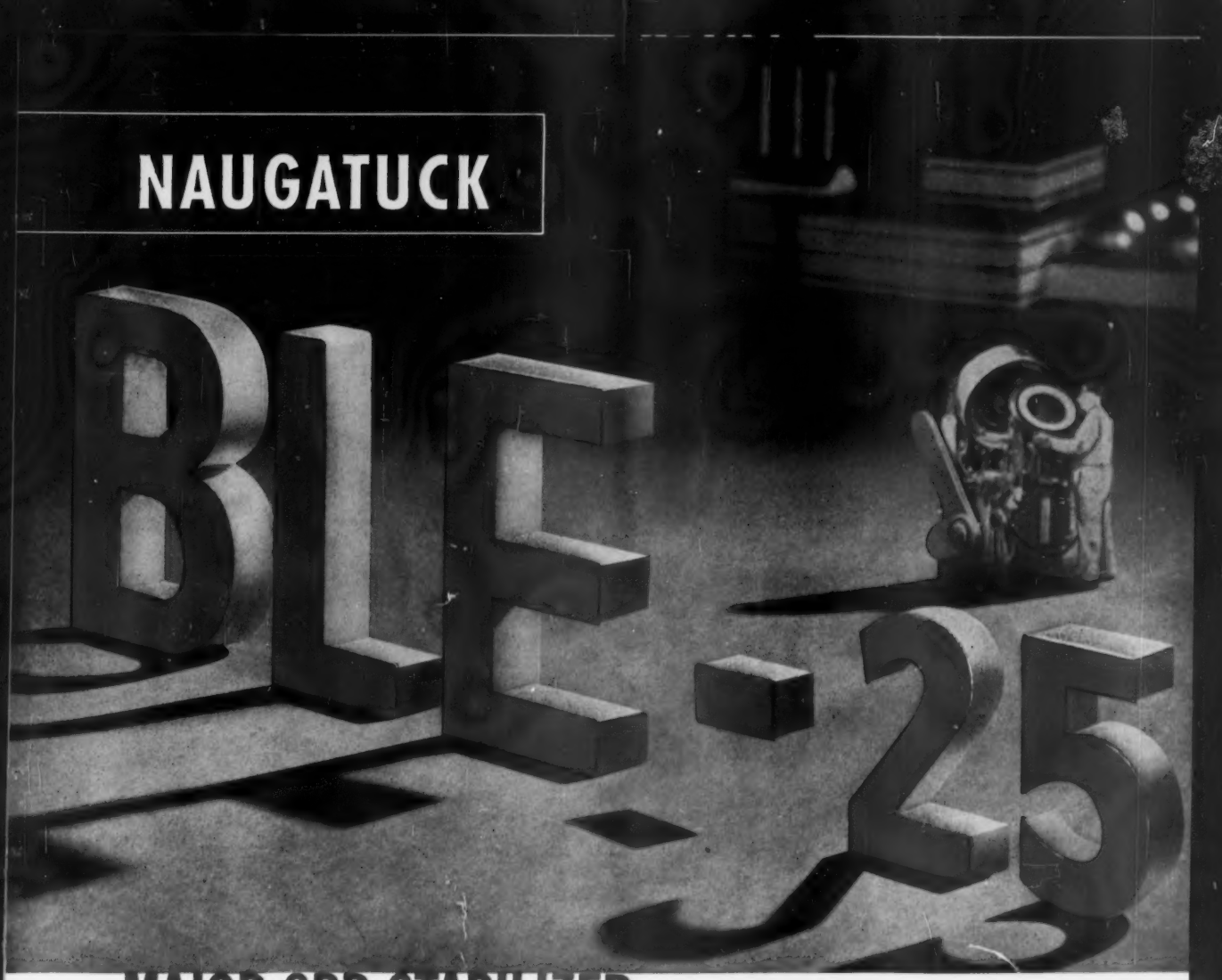

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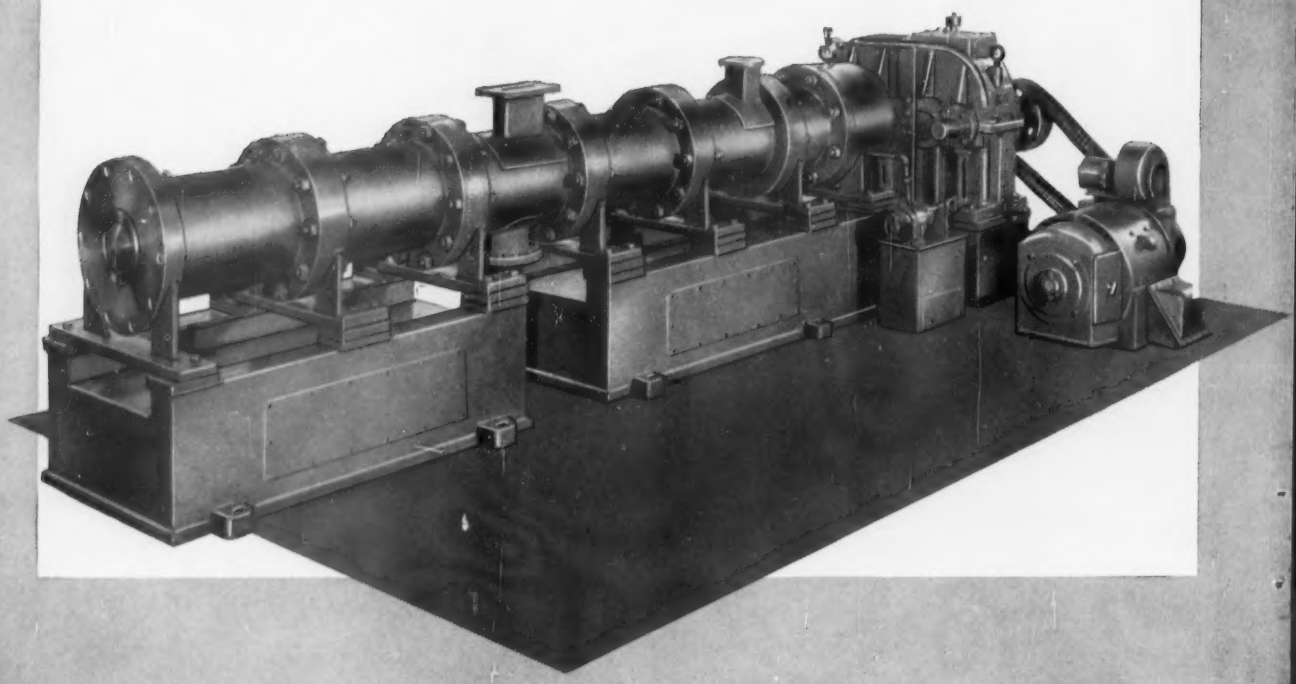

The 8" extruder illustrated fits into a special processing line. Custom designed for a large chemical company, the extruder had to be designed to coordinate with existing processing, blending and mixing facilities.

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1803	HAF-50 PARTS, OIL EXTENDED 25 PARTS AROMATIC OIL, MIXED EMULSIFIER, STAINING ANTIOXIDANT
B-129	EPC-50 PARTS, MIXED EMULSIFIER, NON-STAINING ANTIOXIDANT
B-150	FEF-60 PARTS, OIL EXTENDED 37½ PARTS NAPHTHENIC OIL, ROSIN EMULSIFIER, NON-STAINING ANTIOXIDANT
1601	HAF-50 PARTS, MIXED EMULSIFIER, STAINING ANTIOXIDANT
B-111	HAF-75 PARTS, OIL EXTENDED 37½ PARTS AROMATIC OIL, MIXED EMULSIFIER, STAINING ANTIOXIDANT
1801	HAF-50 PARTS, OIL EXTENDED 25 PARTS NAPHTHENIC OIL, MIXED EMULSIFIER, STAINING ANTIOXIDANT
B-147	ISAF-50 PARTS, ROSIN EMULSIFIER, PLUS 10 PARTS AROMATIC OIL, STAINING ANTIOXIDANT
B-148	FEF-50 PARTS, OIL EXTENDED 37½ PARTS NAPHTHENIC OIL, ROSIN EMULSIFIER, NON-STAINING ANTIOXIDANT
1602	HAF-50 PARTS, MIXED EMULSIFIER, STAINING ANTIOXIDANT
B-110	ISAF-50 PARTS, OIL EXTENDED 37½ PARTS AROMATIC OIL, MIXED EMULSIFIER, STAINING ANTIOXIDANT
B-113	HAF-30 PARTS, MIXED EMULSIFIER, STAINING ANTIOXIDANT
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Overseas

Gwelo—Bata Shoe Factory at Gwelo, Rhodesia, has begun an expansion program which will raise the factory's production capacity by nearly one million pairs of shoes per year to 4.4 million pairs. The expansion program, which will cost 200,000 pounds, includes a new rubber mixing mill.

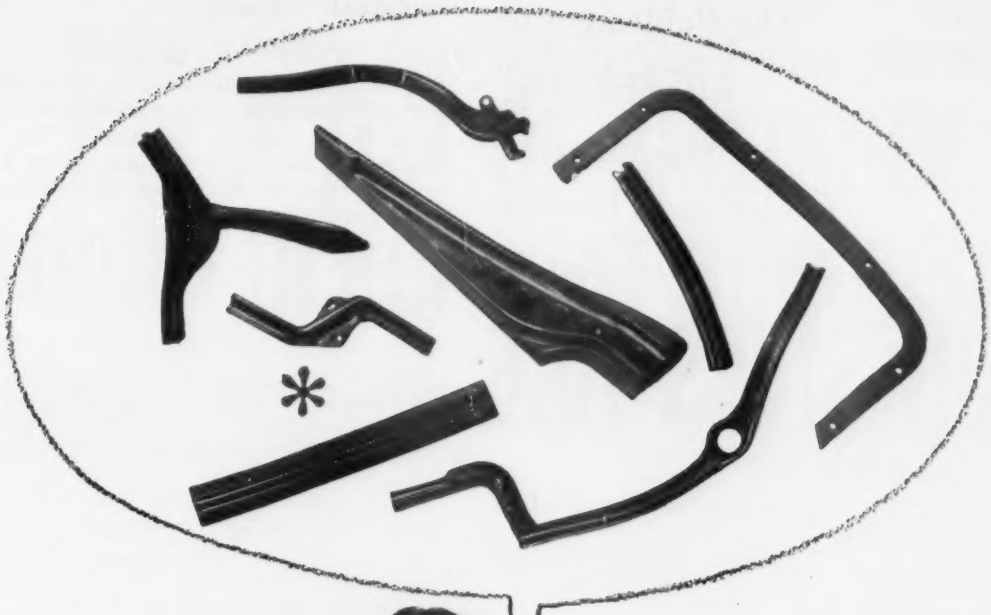
Amsterdam—N. V. Chemische Industrie, A. K. U., a new synthetic rubber plant owned jointly by the Dutch Royal firm of A. K. U. and B. F. Goodrich, has been established at Arnhem. The firm has a capital of 15 million guilders divided into 10 cumulative preference priority shares and 14,990 ordinary shares, each of 1000 guilders.

Marl—The first postwar, large-scale synthetic rubber plant in Germany has ben officially opened. Chemische Werke Huels owns 50 per cent of the $29 million Bunawerke Huels installation, while Badische Anilin - &Soda - Fabrik, Bayer, and Hoechst have equal shares of the other 50 per cent. Capacity of the plant will be 70,000 tons annually of buna rubber instead of the originally planned 45,000 tons. Capacity will be boosted to 90,000 tons annually through additional small investments and installation of equipment is expected to permit further doubling as the need arises. West Germany's synthetic rubber output, produced by Bayer and Chemische Werke Huels, now amounts to 12,000 tons annually compared with 70,000 tons annually produced in East Germany.

Sao Paulo—Organization of a new firm, to be called B. F. Goodrich do Brasil, and plans to build a plant in Campinas, Brazil, have been announced by International B. F. Goodrich. To manufacture tires, tubes, plastics and industrial rubber products for the automotive industry and replacement market, the facility is expected to be completed late in 1959.

Melbourne—Ampol Petroleum, Ltd., an Australian firm and other Australian investors along with International B. F. Goodrich, have organized a new firm, B. F. Goodrich, Australia, Ltd. The firm will build a plant near Melbourne, Victoria, for the manufacture of tires and other products.

Rio de Janeiro—Multitrade NV, an Amsterdam firm, has offered Brazil $6.5 million worth of rubber in exchange for 150,000 bags of coffee from Brazilian Coffee Institute's stocks. The coffee would be placed in the Soviet Union and China.



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OVERSEAS (CONT'D)

Angola—Plans to build a tire factory at Angola, Portugal, have been abandoned by the Portuguese firm, Malor, because authorization has been granted for installation of a competitive factory which is expected to take care of future overseas requirements.

Lisbon—A new tire plant located in Alcochete, approximately 10 miles east of Lisbon, being constructed by Firestone, is scheduled to go into operation late in 1959. To be known as Firestone Portuguesa, the new firm is being established by Firestone and Spanish associates with Portuguese bankers and industrialists. Annual production capacity will be 120,000 truck and passenger tires, including tubes.

Prague — Half of Czechoslovakia's synthetic rubber requirements are expected to be met with the construction of a new synthetic rubber plant at Kralupy Nad Vltavou, near Prague. Test production of rubber from synthetic alcohol will begin in 1964. The new factory will cost $140 million.

Tehran—Construction of Iran's first tire-tube plant, to be built and operated by B. F. Goodrich, is expected to begin in November. With production scheduled to begin about July 1960, the company's investment in the facilities is expected to run to more than $16 million. A group of Iranian investor-associates will share in the building costs.

Peking—A new rubber plant under construction in Huhehot, Inner Mongolia, is expected to have an annual capacity of 30,000 sets of cart tires and 300,000 sets of bicycle tires. In another development, the Tsingtao No. 2 rubber plant has begun the production of several new types of tires. Some of the specialty tires now being manufactured are tubeless, cushionless tires for heavy duty lorries; truck tires with steel wire springs on the outside; truck tires fitted with steel spikes; truck tires made from polychloroprene; tires made without cords for heavy duty universal tractors, and tubeless cushionless tires for trolley buses.

Bonn—West Germany and Bulgaria have made an agreement whereby West Germany will supply Bulgaria with rubber and asbestos goods to the value of 400,000DM and plastics and plastic goods to the value of 2,000,000 DM.

Montevideo—The National Council of Uruguay has issued a decree to the effect that rubber, for the manufacture of tires, and fuel are the only items which can be imported at the preferential rate of 2.10 pesos to the dollar. Other imports will be affected at the rate of 4.11, subject to adjustments in favor of essential goods.

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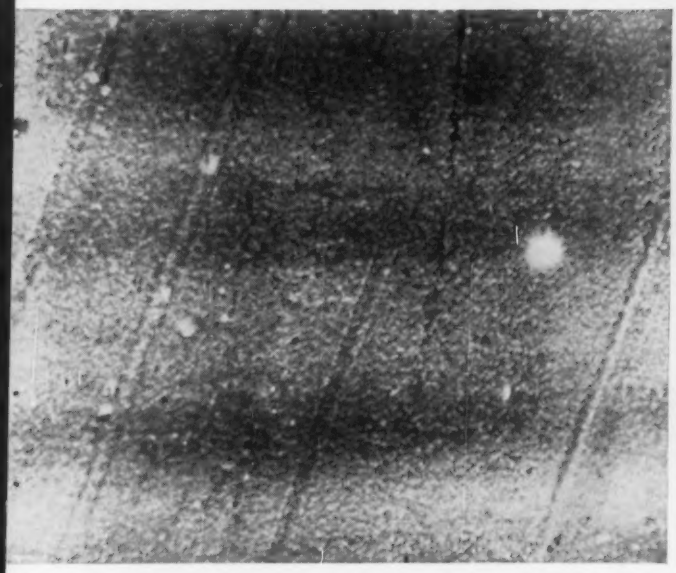
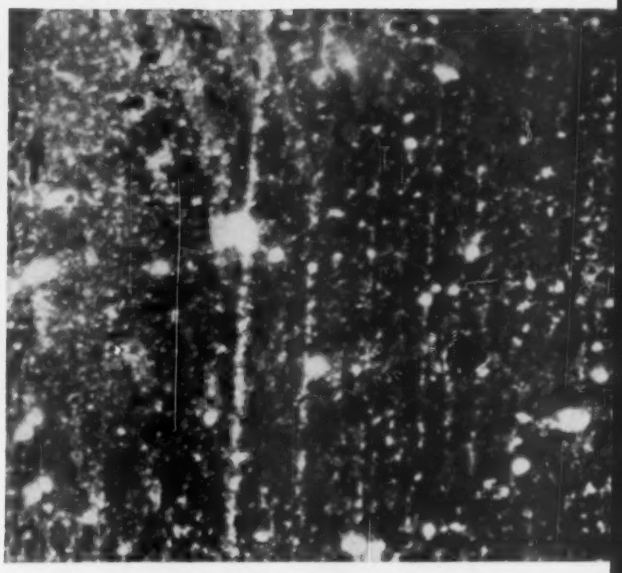


Photomicrograph of Ameripol 4650, after one minute of milling.



Photomicrograph of SBR 1601, after one minute of milling.

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Rubber Manufacturers in Canada

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Laboratory and Testing Equipment: Classified List; Suppliers and Addresses

Accessories and Fittings: Classified List of Products; Suppliers and Addresses

Rubber Chemicals and Compounding Materials: Classified List of Materials; Trade and Brand Names; Suppliers and Addresses

Fabrics and Textiles: Classified List of Materials; Suppliers and Addresses

Natural Rubber and Miscellaneous Gums: Classified List; Suppliers and Addresses; Official Natural Rubber Type Descriptions

Synthetic Rubber: Manufacturers of Synthetic Rubber; Synthetic Rubbers by Type; Other Rubberlike Materials by Type; Suppliers of Butadiene and Styrene

Reclaimed Rubber: Manufacturers and Addresses; Brand Names and Trade Designations; Classified by Application; Classified by Color

Scrap Rubber and Plastics: Classified List; Suppliers and Addresses

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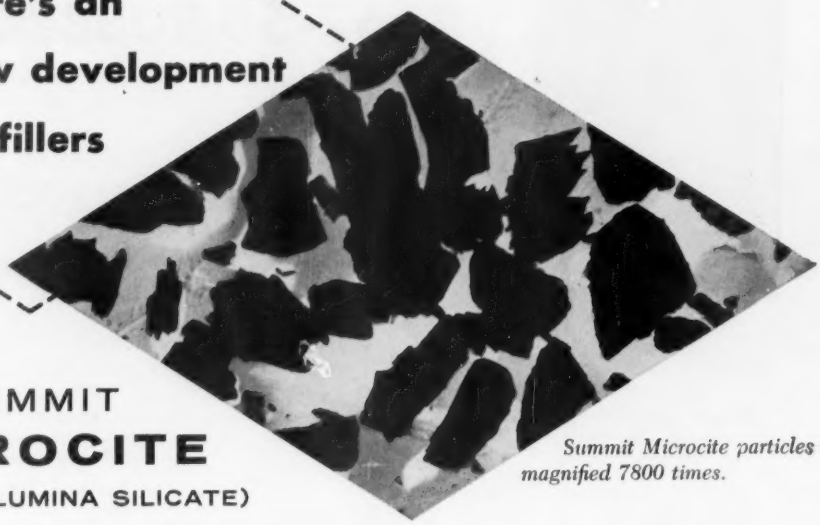

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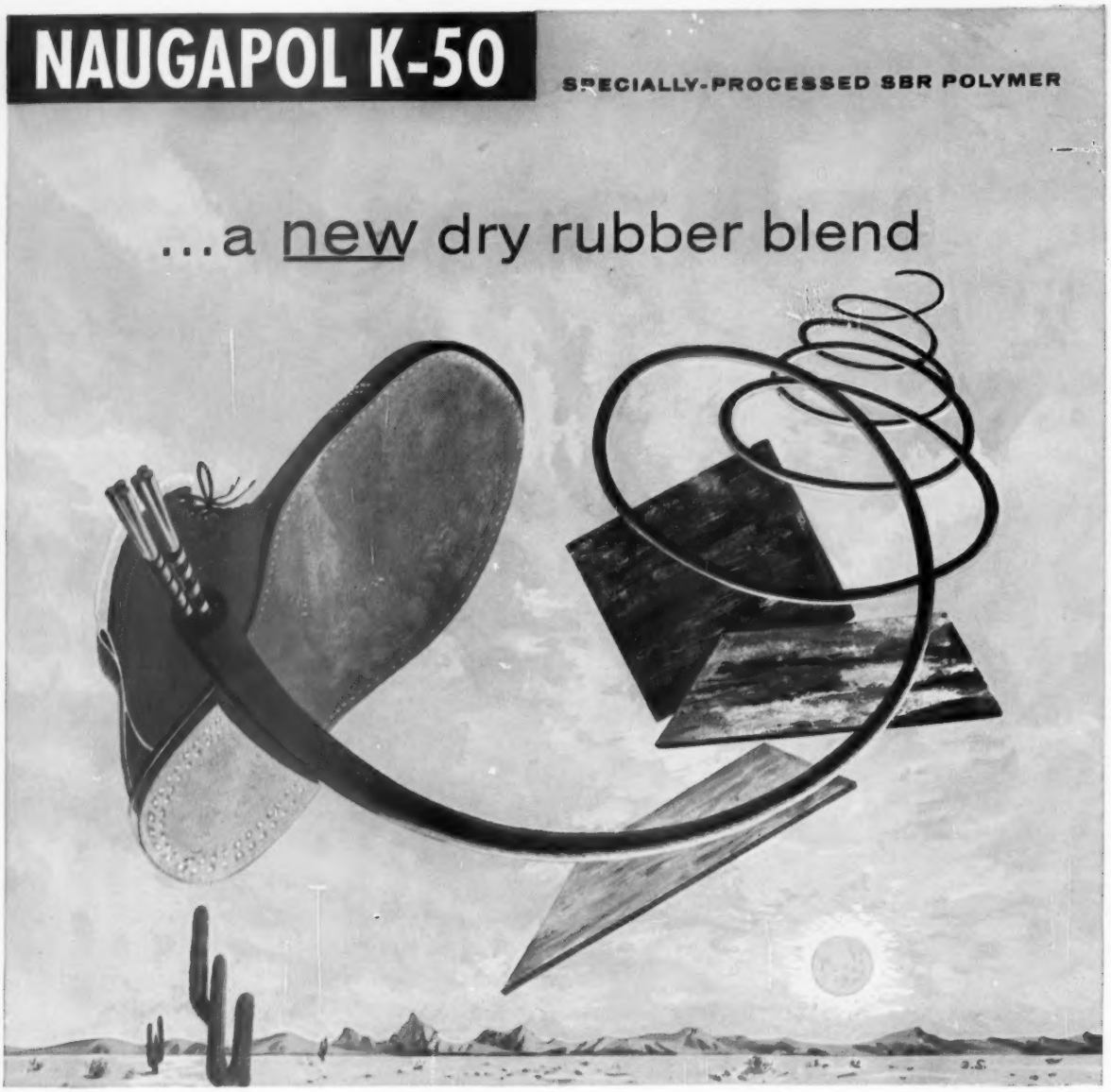

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RUBBER AGE

Vol. 84, No. 1

October, 1958

EFFECTS OF
SILICA FILLERS,
VULCANIZING AGENTS
AND OTHER ADDITIVES ON

Compression Set of Silicone Rubber

By C. W. ROUSH and S. A. BRALEY, Jr.

Silastic Development Section, Product Engineering Laboratories, Dow Corning Corp., Midland, Michigan

THE SERVICE temperature range of gaskets and seals is often established by their resistance to compression set. It is unfortunate that this property is one of those most susceptible to temperature. In many cases, elastomers will show excellent retention of physical strength and rubberiness at temperatures where compression set occurs rapidly.

Silicone rubber retains better resistance to compression set over a wider range of temperature than other synthetic elastomers. Compression set of several elastomers that have good high temperature aging characteristics are compared in Figure 1. The values for this comparison were obtained from the published compounding literature of various manufacturers *(1-4)* and represent the lowest values given, regardless of other physical properties. At 212°F. there are elastomers with as good compression set characteristics as silicone rubber, but at 300°F. or higher, the compression set of silicone rubber is lowest.

The compression set of silicone rubber can be varied considerably by the choice of compounding ingredients. It is the purpose of this paper to describe the compression set resistance of silicone rubber and to show how it is affected by the individual components of the formulation.

Test results at temperatures above room temperature were obtained according to ASTM D-395-55, Method B. The test samples were obtained by plying ⅛ x 1.129-inch diameter discs. The reported results are generally the average of several tests, and in no case less than two separate determinations. Tests below room temperature were made in accordance with ASTM D-1229-55. The test apparatus was a liquid nitrogen cooled box with thermostatic control. The T_{30} (30 minute recovery period) values are reported in all cases.

All compositions, unless otherwise noted, were oven cured 24 hours at 480°F. The press vulcanization varied with the vulcanizing agent used as follows:

Vulcanizing Agent Used	Press Cure
2,4 dichlorobenzoyl peroxide	5 min. @ 260°F.
Benzoyl peroxide	5 min. @ 260°F.
Tertiary butyl perbenzoate	10 min. @ 300°F.
Ditertiary butyl peroxide	10 min. @ 340°F.

Experience has indicated that a variation in compression set of 2 to 3% may be expected from test variables. Variables beyond 2 to 3% may be considered indicative of material or compositional variations.

The polymer used for comparison of the effects of fillers, vulcanizing agents, and additives was a copolymer of dimethyl siloxane and methyl vinyl siloxane. Unless it is otherwise noted, the vinyl group to silicon atom ratio in the polymer is .0014.

Note: This paper was presented before the Division of Rubber Chemistry, ACS, at Cincinnati, Ohio, May 15, 1958.

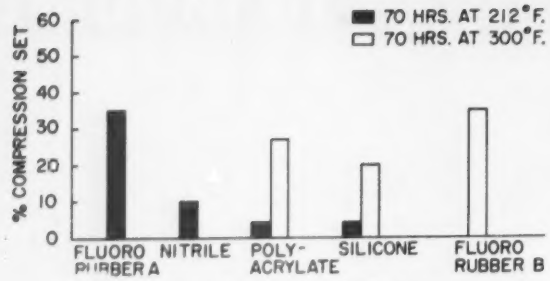

FIG. 1—Compression set of synthetic elastomers.

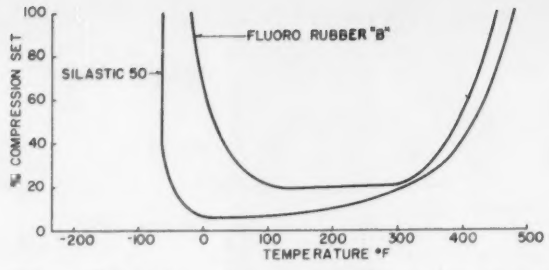

FIG. 2—Effect of temperature on compression set (test time = 22 hours).

Time and Temperature

Compression set of any elastomer depends upon the temperature and the time under compression. At elevated temperatures compression set is caused by rearrangement of the polymer as well as by further interaction between polymer chains and between polymer and filler. At extreme low temperatures, high compression set also occurs and is caused by embrittlement or crystallization. Unlike the effect at elevated temperatures, the elastomer will regain its original dimensions when warmed again to room temperature.

Between the two extremes of temperature lies the service range of the elastomer. The effect of temperature on the compression set of silicone rubber and a fluorocarbon elastomer is shown in Figure 2. Silastic 50 represents a silicone rubber made from a dimethyl siloxane-methyl vinyl siloxane copolymer. The compression set reaches 100% after 22 hours at —60°F. and at +480°F. The compression set at low temperatures changes from good to bad over a very narrow range which corresponds to the embrittlement temperature. For example, at —50°F. the compression set of Silastic 50 is 22%. A similar, but more gradual increase in compression set occurs between 400 and 480°F.

A polymer modification in which some phenyl groups are substituted for methyl groups in the polymer will expand the service temperature range by lowering the temperature at which embrittlement occurs to approximately —130°F. Such data are presented in Table I.

One of the most heat resistant fluorocarbon elastomers exhibits the same behavior for compression set versus temperature. The increase at low temperature is more gradual, however, than that shown by Silastic 50. The compression set after 22 hours is 100% at —20°F. and 70% at 0°F. The rapid increase in compression set at elevated temperatures occurs between 375 and 450°F.

The effect of time under compression on the compression set is the same as for other elastomers. Data for Silastic 50 compressed at 300°F. are shown in Figure 3. There is an initial rapid rise in compression set for the first 40 hours. After this period the compression set increases linearly with time. Tests carried out for periods longer than 40 hours are preferred. However, 22 hours, because of time savings, has been widely used. Both 22 hour and 70 hour compression set results are used in subsequent data.

Composition

The compression set resistance of silicone rubber is affected by all ingredients in the formulation. It is important, therefore, to consider each component. Silicone rubber formulations have few items compared to some elastomers. Essentially, only the polymer, filler, and vulcanizing agent are necessary. There are a few other materials that affect compression set and these will be considered under the discussion of additives.

It is possible to improve greatly one property of an elastomer if other properties are ignored. However, they seldom can be. It was not felt necessary to go beyond practical compounds and, therefore, all formulations, unless otherwise indicated, have a balance of properties which are adequate for many applications.

Polymer Effects

Compression set is greatly affected by polymer composition. The basic silicone polymer is dimethyl polysiloxane:

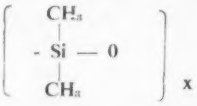

TABLE I—EFFECT OF PHENYL CONCENTRATION IN POLYMER ON COMPRESSION SET OF SILICONE RUBBER

BASE FORMULA

	Parts
Me_2-PhMe-MeVi Silicone Copolymer (.075 Ph/Si, .0014 Vi/Si)	100.0
Dow Corning Silica	35.0
Iron Oxide	3.0
2,4 Dichlorobenzoyl Peroxide	0.6

CURE: 24 HR. @ 480°F.

Phenyl to Silicon Ratio	Compression Set — 22 hours at —140°F.	—85°F.	—60°F.	—50°F.	+300°F.	+400°F.
0	100	100	100	20	14	29
.075	90	45	37	34	17	39
.300	100	100	69	65	15	64

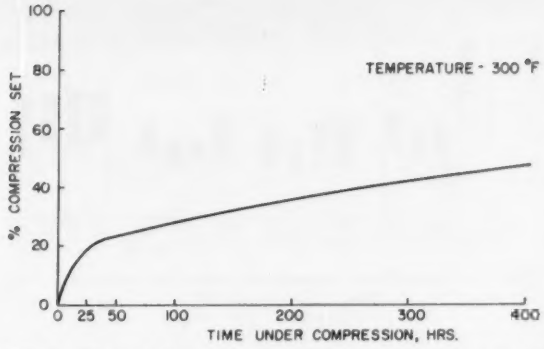

FIG. 3—Effect of time under compression on compression set of Silastic 50.

Elastomers made from this polymer will have poor compression set characteristics unless certain additives are used in the formulation. A basic formulation such as that shown in Figure 4 will exhibit a compression set of 85% after 22 hours at 300°F., and 100% after 70 hours at 300°F. The effect of additives on compression set of dimethyl gums will be discussed in a later section.

The incorporation of a small number of vinyl groups in the silicone polymer makes possible good compression set resistance without the need for additives. The effect of addition of vinyl groups to dimethyl polysiloxane is shown in Figure 4. The vinyl concentration is expressed as the number of vinyl groups per silicon atom in the polymer chain. The compression set drops from 100% to 14% after 70 hours at 300°F. with the incorporation of one vinyl group per 500 silicon atoms (a vinyl to silicon ratio of .002). As the vinyl concentration is increased, the compression set will decrease further. At a vinyl to silicon ratio of .01, the compression set is 10.0%. The effect of vinyl addition to silicone polymers on compression set and other physical properties has been described by others *(5-8)*.

The vinyl groups are more reactive with the peroxide vulcanizing agents than the methyl side groups and, therefore, the vinyl concentration has a great effect on the state of cure of the silicone rubber. The useful range of vinyl concentration ranges from a Vi/Si ratio of .001 to .006. Higher concentrations such as .01 Vi/Si give an overcured elastomer which will have poor heat resistance. To simplify nomenclature, the copolymers of dimethyl siloxane and methyl vinyl siloxane with or without phenyl methyl siloxane will be called vinyl silicone polymers.

The distribution of vinyl groups in the polymer has surprisingly little effect on the compression set. Lowest compression set is obtained when the vinyl groups are evenly distributed throughout the polymer. This is the case when dimethyl siloxane and methyl vinyl siloxane are copolymerized. However, compression set essentially the same as that of the copolymerized polymer can be obtained if the vinyl groups are concentrated on as little as 15% of the total polymer chains. The polymers in Figure 5 were obtained by polyblending. Polymers with a large number of vinyl groups, such as .01 and .04 vinyl groups per silicon atom, were blended on a rubber mill with dimethyl polysiloxane to obtain a final vinyl to silicon ratio of .0014. The compression set begins to increase rapidly if the vinyl groups are concentrated on less than 15% of the polymer chains.

The addition of vinyl groups to the polymer improves compression set at elevated temperatures but does not affect behavior at sub-zero temperatures. The low temperature properties of silicone rubber are improved by the substitution of phenyl groups for some of the methyl side groups on the polymer *(9)*. When the optimum concentration of phenyl groups is used on the polymer, the temperature at which stiffening occurs is reduced from −55 to −130°F.

If a silicone elastomer is compressed and then cooled below its stiffening temperature, it will take

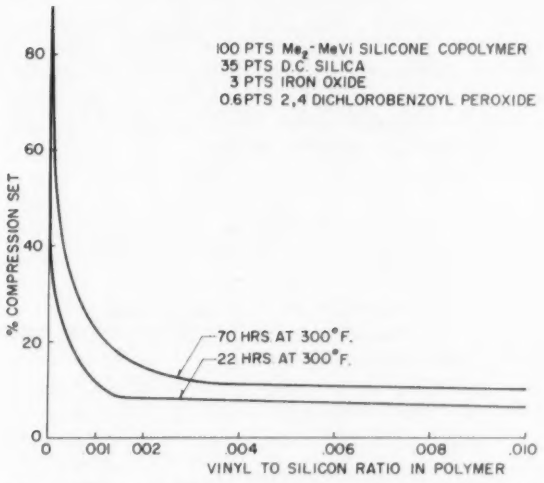

FIG. 4—Effect of vinyl concentration in polymer on compression set.

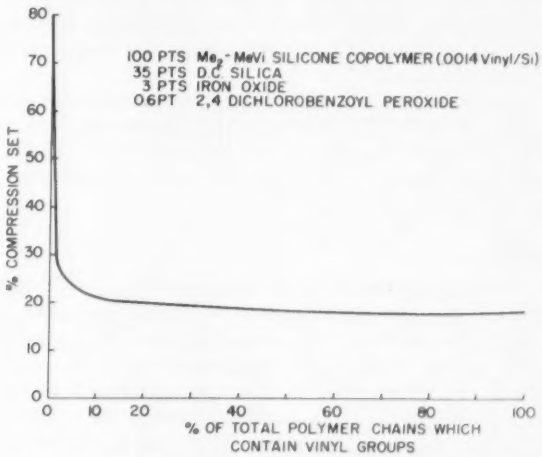

FIG. 5—Effect of distribution of vinyl groups in polymer on compression set (test time = 70 hours at 300°F.).

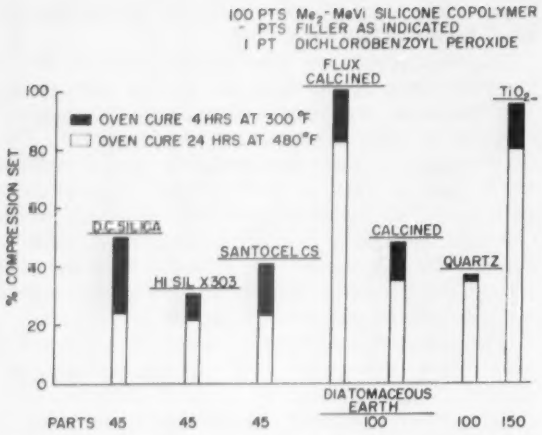

FIG. 6—Effect of filler on compression set (test time = 70 hours at 300°F.).

100% set because it is too stiff to return to its original shape. Therefore, the stiffening temperature, such as that determined by the Gehman or Clash-Berg equipment, can be taken as the temperature at which compression set tests fail. However, when the material is subsequently warmed above its stiffening point, it regains its flexibility and its good compression set properties. The dimethyl-methyl vinyl copolymer at −60°F. takes 100% compression set after exposure for 22 hours. At higher temperatures, −50°F., flexibility is not damaged and good compression set resistance is obtained (Table I).

The additions of phenyl groups to the polymer up to ten phenyl groups per 100 silicon atoms result in a reduction of the stiffening temperature and a corresponding improvement in compression set. However, as the phenyl concentration is increased above ten, the stiffening temperature increases with subsequent damage to the compression set properties. In Table I, the compression set resistance of a polymer with phenyl to silicon ratio of .075 is good down to −130°F. However, a polymer with .30 phenyl to silicon concentration is only slightly better than the polymer without phenyl substitution. Further increase in phenyl content results in even poorer low temperature compression set.

The compression set at elevated temperatures for polymers with .075 phenyl to silicon concentration is similar to the non-phenyl polymers. However, higher phenyl concentrations result in poorer compression set properties above 300°F.

Fillers

The compression set of silicone rubber also depends upon the fillers used in the formulation. Materials commonly used for reinforcing the silicone polymer can be divided into two general types: the synthetic fine silicas which produce the maximum in physical properties, and the semi-reinforcing fillers which produce stocks with poor elongation and tear strength. The common semi-reinforcing fillers are naturally occurring silicas and metallic oxides.

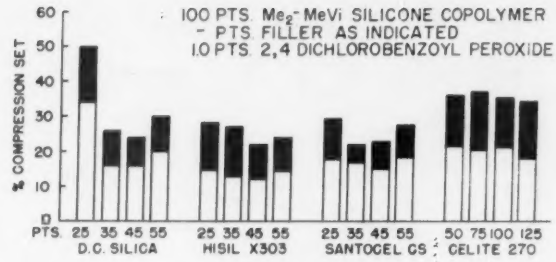
100 PTS Me_2-MeVi SILICONE COPOLYMER
- PTS FILLER AS INDICATED
1.0 PTS 2,4 DICHLOROBENZOYL PEROXIDE
% COMPRESSION SET
PTS 25 35 45 55 D.C. SILICA
25 35 45 55 HISIL X303
25 35 45 55 SANTOCEL CS
50 75 100 125 CELITE 270

FIG. 7—Effect of filler concentration on compression set (test time = 70 hours at 300°F.).

Figure 6 presents the effect of the commonly used fillers on compression set. The reinforcing fillers are Dow Corning Silica, HiSil X-303, and Santocel CS. Dow Corning Silica is a fumed silica made by burning silicon tetrachloride in hydrogen and oxygen. Cab-O-Sil (Godfrey L. Cabot) is made by the same process and can be substituted for the Dow Corning Silica. HiSil X-303 (Columbia-Southern) and Santocel CS (Monsanto Chemical) are silicas precipitated from water solutions.

HiSil X-303, for most applications, is considered the best filler for compression set. As indicated in Figure 6, compression set after 70 hours at 300°F. will be approximately 20%. In addition, compounds made from HiSil X-303 require less cure to obtain low compression set than other fillers. For example, most compounds will have a compression set of 35 to 40% after a press cure and without any oven postcure. A comparison of HiSil X-303 with other fillers after a short oven cure is also made in Figure 6.

Dow Corning Silica and Santocel CS have similar effect upon compression set. Both will produce compounds with approximately 25% compression set after 70 hours at 300°F. In compounds that do not contain a heat stability additive, however, such as the one used to obtain the data for Figure 6, Santocel CS will have slightly better compression set properties than Dow Corning Silica, but not as good as Hi-Sil X-303.

The semi-reinforcing fillers commonly used in silicone rubber are diatomaceous earth and quartz. Metallic oxides, such as titanium dioxide, zinc oxide, and iron oxide, were once widely employed but now are used only in specialty stocks.

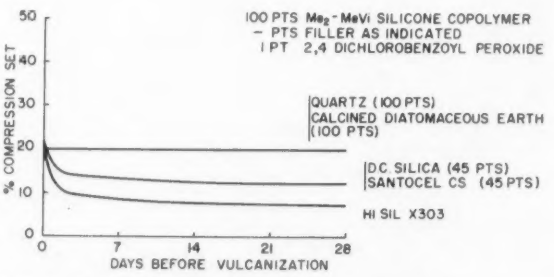
100 PTS Me_2-MeVi SILICONE COPOLYMER
- PTS FILLER AS INDICATED
1 PT 2,4 DICHLOROBENZOYL PEROXIDE
% COMPRESSION SET
QUARTZ (100 PTS)
CALCINED DIATOMACEOUS EARTH (100 PTS)
D.C. SILICA (45 PTS)
SANTOCEL CS (45 PTS)
HI SIL X303
DAYS BEFORE VULCANIZATION

FIG. 8—Effect of shelf aging unvulcanized compounds on compression set (test time = 22 hours at 300°F.).

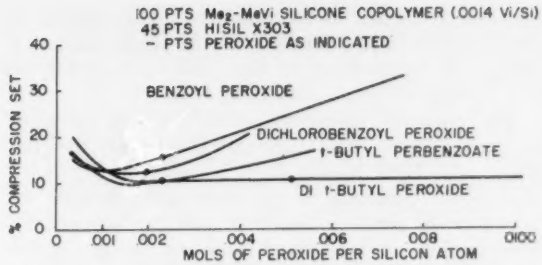

FIG. 9—Effect of peroxide concentration with highly reinforcing silica on compression set (test time = 22 hours at 300°F.; dot = recommended concentration).

Diatomaceous earth will vary in effect upon compression set, depending upon how it is processed. The flux calcined materials (Celite Super Floss, Johns-Manville) have a desirable white color but are poor for compression set unless used with certain additives or with di-t-butyl peroxide (Table VI). The effect of additives will be discussed in another section. The effect of diatomaceous earth calcined with and without a flux on the compression set of an elastomer based on a vinyl silicone gum is shown in Figure 6. The compound reinforced with the flux calcined diatomaceous earth has 85% compression set after 70 hours at 300°F. but only 35% with calcined diatomaceous earth. The calcined diatomaceous earth (Celite 270, Johns-Manville) is tan, however, and produces brown compounds which are difficult to pigment to a light color.

Finely ground quartz (Neo Novacite, Malvern Chemicals) is becoming a popular extending filler. It is very inactive toward the polymer and, therefore, can be used in large amounts with a minimum effect on physical properties. Compounds with very good compression set properties can be made from quartz. However, it is always used in conjunction with other fillers since the physical properties are very poor when used alone. The data presented in Figures 6 and 8 are for illustrative purposes only. The compression set of an elastomer containing 100 parts of quartz has a compression set of 35% after 70 hours at 300°F.

The metallic oxides, when used as the only filler, produce stocks with poor compression set, even when used with a vinyl gum. Typical data for titanium dioxide are shown in Figure 6. Additives will not improve the compression set of such stocks. However, vulcanization by di-t-butyl peroxide will result in low compression set compounds.

The compression set will vary slightly with the concentration of reinforcing filler (Figure 7). At 25 parts by weight the compression set is high relative to values obtained with 35 and 45 parts of filler. The compression set is poorer for concentrations of filler above 45 parts. It is interesting to note that a loading of 25 parts of silica is below the concentration that will give good tensile and tear properties. Optimum physical properties are obtained by using from 35 to 45 parts of silica.

The semi-reinforcing fillers do not exhibit a concentration effect on compression set. Compression set is approximately the same for compounds containing from 50 to 125 parts of calcined diatomaceous earth. These data are presented in Figure 7.

The reinforcing type silicas exhibit another phenomenon which should be considered when using silicone rubber. The hardness and compression set of such stocks will decrease as the length of storage between mixing the compound and vulcanization increases. As shown in Figure 8, a vinyl silicone polymer reinforced with Dow Corning Silica, HiSil X-303 or Santocel CS will have relatively high compression set if vulcanized on the same day the filler is incorporated. If the unvulcanized stock is allowed to age, the compression set will decrease. The greatest change in compression set occurs in the first few days. Thereafter, the change is slight.

It should be noted that the compression set of the vulcanized silicone rubber does not change during storage. It is only when the unvulcanized stock is shelf aged that changes occur.

Stocks containing semi-reinforcing fillers do not exhibit such a drop in compression set. Vulcanizates made of compounds containing quartz or diatomaceous earth will have the same compression set one day or four weeks after mixing (Figure 8).

Vulcanizing Agents

Compression set is affected by the vulcanizing agent and by the concentration of agent. The vulcanizing agents are primarily organic peroxides. At the present time there are four peroxides commercially used: benzoyl peroxide, bis 2,4 dichlorobenzoyl peroxide, t-butyl perbenzoate (TBPB) and di-t-butyl peroxide (DTBP).

DTBP is the best peroxide for low compression set. It is reactive only with silicone polymers that contain vinyl groups *(6, 8)*. The state of cure, therefore, is determined primarily by the vinyl concentration of the polymer and affected very little by the peroxide concentration above a certain minimum amount. The selective vulcanization of DTBP is indicated in Figures 9 and 10. The effect of peroxide concentration on compression set of compounds based on a vinyl silicone polymer (.0014 Vi/Si) containing a highly reinforcing silica, HiSil X-303, is shown in Figure 9.

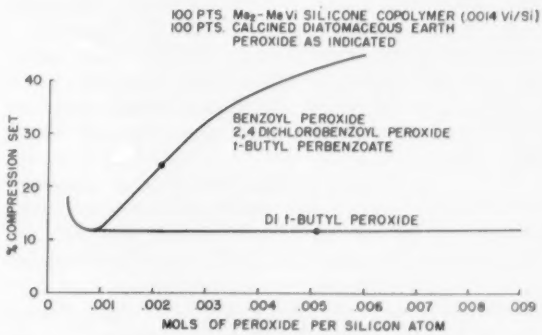

FIG. 10—Effect of peroxide concentration with semi-reinforcing filler on compression set (test time = 22 hours at 300°F.; dot = recommended concentration).

TABLE II—EFFECT OF PEROXIDE CONCENTRATION ON COMPRESSION SET OF SILICONE RUBBER

BASE FORMULA

	Parts
Vinyl Silicone Copolymer (.0014 Vi/Si)	100
Filler	As indicated
Peroxide	As indicated

CURE: 24 HR. @ 480°F.

			Compression Set—22 hours at 300°F.	
Peroxide	Parts	Mols Peroxide Per Silicon	HiSil X—303 45 Parts	Calcined Diatomaceous Earth—100 Parts
Benzoyl Peroxide	0.125	.00038	16	20
	0.25	.00075	13	12
	0.75*	.00230	16	27
	1.25	.00383	21	37
	2.5	.00755	33	50
2,4 Dichloro-Benzoyl Peroxide	0.20	.00039	17	19
	0.60	.00118	13	13
	1.00*	.00196	13	23
	2.00	.00392	19	40
Tertiary Butyl Per-benzoate	0.10	.00038	15	12
	0.30	.00115	9	14
	0.60*	.00229	13	26
	1.50	.00573	17	38
Ditertiary Butyl Peroxide	0.08	.00041	20	15
	0.25	.00127	12	12
	0.50	.00253	10	13
	1.00*	.00507	12	11
	3.00	.01522	12	11

* Recommended concentration for general purposes.

Figure 10 shows similar data on compounds containing a semi-reinforcing filler, calcined diatomaceous earth. The concentration of peroxide is expressed as mols of peroxide per mol of polymer. Since the recurring polymer unit is $(CH_3)_2SiO$-, this ratio is the same as mols of peroxide per silicon atom.

DTBP behaves the same way with both types of filler. With HiSil X-303, as shown in Figure 9, the compression set after 22 hours at 300°F. is 20% with .0004 mols DTBP per silicon atom. The compression set decreases to 11% at .0015 mols per silicon atom and thereafter is constant. The same curve is followed by DTBP with diatomaceous earth (Figure 10), except that the point at which minimum compression set is reached is approximately .0008 mols per silicon atom.

Benzoyl peroxide, 2,4 dichlorobenzoyl peroxide, and TBPB vulcanize both vinyl and non-vinyl silicone polymers. The state of cure, therefore, is affected by the peroxide concentration. In a vinyl silicone polymer there is an optimum concentration for each peroxide with respect to compression set. The optimum concentration of peroxide is in turn affected by the type of filler. For highly reinforcing silicas, the minimum compression set occurs when the molecules of peroxide are equal to the number of vinyl groups in the polymer (.0014 Vi/Si). If the concentration of catalyst is either more or less, the compression set will be higher. This is shown in Figure 9.

The optimum concentration of peroxide for compression set with diatomaceous earth is only half that found with HiSil X-303. This is shown in Figure 10. Since each molecule of peroxide upon heating decomposes to produce two free radicals, the optimum compression set is obtained when the number of free radicals is equal to the number of vinyl groups in the polymer. With HiSil X-303, the effect of excess peroxide is much less severe than with diatomaceous earth.

With diatomaceous earth, the results obtained with benzoyl peroxide, 2,4 dichlorobenzoyl peroxide and TBPB were similar enough to allow one curve to represent the effect of all three. With HiSil X-303, however, the effect of excess TBPB on compression set appears to be intermediate to that of benzoyl peroxide and DTBP. Perhaps this is to be expected, since, chemically, TBPB is a combination of these two catalysts. With HiSil X-303, the 2,4 dichlorobenzoyl peroxide reacts similarly to benzoyl peroxide. The data presented in Figures 9 and 10 are also given in Table II in more familiar terms of concentration, parts by weight of peroxide per 100 parts of polymer.

The optimum concentration of peroxide for compression set is generally lower than the concentration normally recommended because of other effects. The

TABLE III—EFFECT OF PEROXIDE ON COMPRESSION SET OF COMPOUNDS WITHOUT OVEN CURE

BASE FORMULA

	Parts
Vinyl Silicone Copolymer (.0014 Vi/Si)	100
Filler	As indicated
Peroxide	As indicated

PRESS VULCANIZED ONLY

Peroxide	Parts	HiSil X-303 – 45 Parts	Dow Corning Silica – 45 Parts	Calcined Diatomaceous Earth—100 Parts
Ditertiary Butyl Peroxide	1.0	33	40	14
Benzoyl Peroxide	0.25*	—	—	19.4
	0.45**	30	100	—
	0.75***	31	100	38
2,4 Dichloro-Benzoyl Peroxide	0.4*	—	—	30
	0.7**	25	100	—
	1.0***	27	100	33
Tertiary Butyl Perbenzoate	0.2*	—	—	20
	0.4**	27	90	—
	0.6***	27	95	35

* Optimum concentration with diatomaceous earth; ** Optimum concentration with HiSil X-303; *** Recommended concentration for general purposes.

principal limitation is air inhibition during vulcanization. The peroxide catalyst will react with air in preference to silicone polymers. If air is entrapped in a mold or if the the silicone part is vulcanized in open air, the silicone rubber in contact with the air will be left unvulcanized. If sufficient excess catalyst is present, this air inhibition can be minimized. The recommended concentrations for the various peroxides is indicated by points on the curves in Figures 9 and 10.

DTBP is recommended far in excess of its minimum concentration because it is a volatile liquid. Since the physical properties are affected little by the excess catalyst, allowance for evaporation of the peroxide can be made.

Peroxide concentration in non-vinyl silicone polymers also affects the compression set properties of the elastomer *(8)*. In general, the compression set becomes poorer with increasing peroxide concentration. However, the compression set is poor for all concentrations (50 to 80% compression set after 22 hours at 300°F.) which makes such compounds of little interest for compression set applications. Low compression set in compounds based on non-vinyl silicone polymers is generally obtained with certain additives as indicated in a later section. Such additives overshadow any peroxide effects.

The compression set without oven postcures is also affected by the catalyst, as well as the filler. In general, DTBP gives superior compression set at short cures but the advantage for DTBP depends upon the filler. As shown in Table III, a compound reinforced with HiSil X-303, without an oven cure, will have essentially the same compression set for each of the four peroxides. Concentration effects, as shown in Figures 9 and 10, also occur in compounds with only short cures. The difference in compression set is only slight between HiSil X-303 compounds vulcanized with the optimum concentration of peroxide and with that concentration recommended for general purpose.

When diatomaceous earth is used, the greater effect of excess peroxide concentration on compression set, indicated in Figure 10, is also evident at short cures. At recommended concentrations of peroxide, the difference between DTBP and the other three peroxides is appreciable (Table III). However, at the optimum concentration for compression set, which is not practical to use because of air inhibition, the benzoyl peroxide and TBPB give results almost as low as those with DTBP and lower than those obtained with HiSil X-303. In stocks utilizing 2,4 dichlorobenzoyl peroxide, the compression set at short cures is little affected by the concentration of peroxide.

Dow Corning Silica filled stocks, when vulcanized with benzoyl peroxide, 2,4 dichlorobenzoyl peroxide and TBPB will have 100% compression set if given no oven cure. The concentration of peroxide has little effect. When DTBP is used, the compression set without oven cure is 40%, which is approximately the same as the result obtained with HiSil X-303, but not as low as that obtained with diatomaceous earth.

TABLE IV — EFFECT OF VARIOUS COMPOUNDS ON COMPRESSION SET OF NON-VINYL SILICONE RUBBER

BASE FORMULA

	Parts
Dimethyl Silicone Polymer	100
Flux Calcined Diatomaceous Earth	100
Benzoyl Peroxide	3

OVEN CURE: 24 HR. @ 480°F.

Additive	Parts per 100 Parts Polymer	Compression Set 22 Hours 300°F.	Compression Set 70 Hours 300°F.
None	0.0	80	100
Mercuric oxide	1.5	10	17
Cadmium oxide	1.5	15	23
Cadmium carbonate	1.0	15	25
Zinc oxide	1.0	18	30
Zinc oxide	3.0	26	34
Zinc oxide	6.0	19	25
Zinc peroxide	0.5	13	30
Cadmium sulphide	1.0	64	62
Cadmium sulphate	1.0	46	64
Cadmium iodide	1.0	45	62
Magnesium zirconate	1.0	42	61
Magnesium zirconate	3.0	26	35
Magnesium zirconate	6.0	30	40
Gold oxide	2.0	31	—
Cadmium peroxide	2.0	31	—
Thallic oxide	2.0	40	—
Lead chromate	2.0	42	—
2,4 di-t-butyl quinone	2.0	21	32

Additives

Before the introduction of the first commercial vinyl silicone polymers early in 1953, low compression set was obtained through the use of various additives. A great many compounds, principally the metallic oxides, were found that would reduce the compression set. The best compounds were mercuric or mercurous oxide *(10)* and cadmium oxide *(11)*. Table IV presents a list of additives that were beneficial. They were found to be useful only with silica fillers. They would not decrease the compression set of stocks reinforced with other types of fillers.

The compression set of a non-vinyl silicone polymer reinforced with diatomaceous earth is 100% after 70 hours at 300°F. Mercuric oxide reduces the compression set to 17% and cadmium oxide to 23%. These particular oxides, however, are toxic if taken internally. Since they give off fumes during oven cure, it is necessary to process these stocks in well ventilated ovens. Many years of use have shown that processing can be carried on safely, however.

Zinc oxide also is effective in reducing compression set. Although it is not as effective as mercuric oxide or cadmium oxide, it has the advantage of being nontoxic. 2,4 di-t-butyl quinone *(12)* is also a non-toxic additive that can be used to obtain low compression set with non-vinyl silicone polymers.

These additives require a relatively long oven postcure at 480°F. to obtain low compression set. At

TABLE V—EFFECT OF OVEN CURE ON COMPRESSION SET OF VINYL AND NON-VINYL SILICONE RUBBER

BASE FORMULA

	Parts
Silicone Polymer (as indicated)	100
Dow Corning Silica	35
Flux Calcined Diatomaceous Earth	20
Iron Oxide	3
2,4 Dichlorobenzoyl Peroxide	As indicated
Cadmium Oxide	As indicated

COMPRESSION SET: 22 HOURS @ 300°F.

Polymer	Parts Peroxide	Parts CdO	Oven Cure: None	24 Hours 300°F.	4 Hours 400°F.	24 Hours 400°F.	1 Hour 480°F.	8 Hours 480°F.	24 Hours 480°F.
No Vinyl	1.5	1.5	100	100	87	50	85	52	21
.0014 Vi/Si	1.0	—	69	42	45	24	35	26	18

short cures at low temperatures, the compression set is very poor. The incorporation of vinyl groups in the silicone polymer reduces the oven cure necessary for low compression set. This effect is illustrated in Table V.

In general, stocks based on vinyl silicone polymers do not require additives to obtain low compression set. However, additives are necessary with certain fillers. Flux calcined diatomaceous earth causes poor compression set in vinyl silicone polymers, if not vulcanized with DTBP. Mercuric oxide, however, will produce low compression set. Such an additive has little effect on compounds containing other fillers. In Table VI, a vinyl silicone polymer reinforced with flux calcined diatomaceous earth has a compression set of 72% after 22 hours at 300°F. Mercuric oxide reduced the compression set to 12%. These results are similar to those given in Table IV for non-vinyl silicone gums. Vulcanization with DTBP instead of 2,4 dichlorobenzoyl peroxide reduces the compression set to 15% without mercuric oxide. A compound reinforced with HiSil X-303 has the same compression set with or without mercuric oxide.

TABLE VI—EFFECT OF MERCURIC OXIDE ON COMPRESSION SET OF VINYL-METHYL SILICONE COPOLYMERS

	Parts				
Vinyl Silicone Polymer (.0014 Vi/Si)	100.0	100.0	100.0	100.0	100.0
Flux Calcined Diatomaceous Earth	100.0	100.0	—	—	100.0
HiSil X-303	—	—	45.0	45.0	—
Mercuric Oxide	—	1.5	—	1.5	—
2,4 Dichlorobenzoyl Peroxide	1.0	1.0	1.0	1.0	—
Ditertiary Butyl Peroxide	—	—	—	—	1.0
OVEN CURE: 24 HR. @ 480°F.					
% Compression set (22 Hours 300°F.)	72	12	13	12	15

Dow Corning Silica requires a heat stability additive to obtain the best physical properties. The compression set of the heat stabilized compounds is also better. The effect of such additives as iron oxide, barium zirconate and carbon black is indicated in Table VII. The compression set after 22 hours at 300°F. is reduced from 20 to 10%. These additives, unlike the compression set additives previously discussed, improve heat stability of the elastomer. Improved compression set is only one of their effects. Note that zinc oxide, which does not improve heat stability, also does not lower compression set. If a filler has sufficient heat stability to retain properties after an oven cure, the heat stability additives will have little effect. Iron oxide has little effect on the compression set of a HiSil X-303 filled compound, as shown in Table VII.

TABLE VII—EFFECT OF HEAT STABILITY ADDITIVES ON COMPRESSION SET

BASE FORMULA

	Parts
Vinyl Silicone Polymer (.0028 Vi/Si)	100.0
Filler (as indicated)	35.0
2,4 Dichlorobenzoyl Peroxide	0.6

CURE: 24 HR. @ 480°F.

Filler	Additive	Parts per 100 Parts Polymer	Compression Set 22 Hours 300°F.
Dow Corning Silica	None	—	20.5*
	Red Iron Oxide	3.0	10.0
	Barium Zirconate	5.0	13.7
	Carbon Black	0.5	11.2
	Zinc Oxide	1.0	21.0*
Hi-Sil X-303	None	—	10.5
	Red Iron Oxide	3.0	7.5

* These compounds were badly overcured.

Summary

Silicone rubber depends upon every ingredient in the formulation for its superior compression set properties. Silicone polymers which contain a small concentration of vinyl groups are the present basis for best low compression set compounds. Compression set improves with increase in vinyl concentration but the state of cure also increases. A compromise between physical properties and compression set is necessary. The useful range of vinyl concentration is .001 to .006 vinyl groups per silicon. Phenyl groups substituted on the silicone polymer improve rubbery properties at sub-zero temperatures. Good compression set properties extend to the lowest temperatures when the phenyl to silicon ratio is between .075 to .10. Compression set becomes poorer with either greater or less phenyl substitution.

Low compression set may be obtained with almost all silica fillers. HiSil X-303 is superior to other reinforcing fillers in this respect. Flux calcined diatomaceous earths require an additive such as mercuric oxide or vulcanization with DTBP.

The vulcanizing agent also affects compression set. DTBP is superior to the other three commonly used peroxides. The compression set resistance is relatively insensitive to concentration of DTBP. However, benzoyl peroxide, 2,4 dichlorobenzoyl peroxide and TBPB exhibit an optimum concentration for lowest compression set. This optimum occurs when the concentration of peroxide equals the concentration of vinyl groups in the polymer when HiSil X-303 is used. However, when semi-reinforcing fillers, such as calcined diatomaceous earth, are used, the optimum compression set occurs when the concentration of free radicals is equal to the vinyl concentration.

Certain additives are required to obtain low compression set with non-vinyl containing silicone polymers. They consist largely of metallic oxides, but certain organic materials are also effective. Heat stability additives are beneficial for compression set of Dow Corning Silica filled compounds.

LITERATURE REFERENCES

(1) "Viton A, A Synthetic Rubber," *Development Products Report No. 3,* Elastomer Chemicals Department, E. I. du Pont de Nemours & Co., Inc.

(2) *Hycar Technical Newsletter,* Vol. 2, B. F. Goodrich Chemical Co.

(3) "Polyacrylic Rubber," *Service Bulletin H-11,* B. F. Goodrich Chemical Co.

(4) "Kel-F Elastomer—Properties-Applications," M. W. Kellogg Co. (Now available from Minnesota Mining and Manufacturing Co., Inc.)

(5) Hurd, D. T., and Roedel, G. F., "Vinyl and Allyl Silicone Polymers and Copolymers," *Ind. Eng. Chem.,* Vol. 40, p. 2078 (1948).

(6) Dunham, M. L., Bailey, D. L., and Mixer, R. Y., "New Curing System for Silicone Rubber," Paper presented before Division of Rubber Chemistry, ACS (May, 1956).

(7) Lorenz, J. H., and Dunham, M. L., "Properties and Uses of a New Vinyl-Containing Silicone Rubber," Paper presented before Division of Rubber Chemistry, ACS (May, 1956).

(8) Harper, J. R., Chipman, A. D., and Konkle, G. M., "Vulcanization of Silicone Rubber," *Rubber World,* Vol. 137, p. 711 (1958).

(9) Polmanteer, K. E., Servais, P. C., and Konkle, G. M., "Low Temperature Behavior of Silicone and Organic Rubbers," *Ind. Eng. Chem.,* Vol. 44, p. 1576 (1952).

(10) U. S. Patent No. 2,448,530, General Electric Co.

(11) U. S. Patent No. 2,684,957 Dow Corning Corp.

(12) U. S. Patent No. 2,666,041, General Electric Co.

Coming Next Month...

The Colimetric Determination of Amine Antioxidants—By C. L. Hilton, Research Center, U. S. Rubber Co., Wayne, N. J.

A method for the qualitative identification and quantitative estimation of many of the more common amine antioxidants in miscellaneous rubber stocks is described.

High Temperature Resistance of Bonded Polymer-to-Metal Assemblies—By Stewart L. Brams and Frederick W. Gage, Dayton Chemical Products Laboratories, Inc., West Alexandria, Ohio

A study which indicates that concepts of the high temperature limits of bonded assemblies should be raised considerably.

Temporary Bonding of Nylon to Rubber—By H. H. Gillman and R. W. Childers, Bishop Manufacturing Corp., Cedar Grove, N. J.

A bonding process which permits complete separation of fabric and elastomer by washing in warm water.

Determining Discoloration of Rubberlike Films by Reflectance Spectrometry—By James T. Hill and Fred Leonard, U. S. Army Prosthetics Research Laboratory, Walter Reed Army Medical Center, Washington 12, D. C.

Measurement of degree of discoloration, and recording of data for later use.

APPLICATION OF
Volatile Organic Liquids
for Expanding Flexible Urethane Foam

By ERNST KLESPER
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IN RECENT years the methods and raw materials used for the production of flexible polyurethane foams have developed a general uniformity. Two major methods have been adopted. The first is the so-called "one shot" method and the other is the "prepolymer" method. Polyesters or polyethers and polyisocyanates (particularly tolylenediisocyanate, because of its favorable price) are the essential raw materials needed to make foams. Other raw materials include water, catalysts of the tertiary amine type and certain emulsifiers which are mostly nonionic. The polyesters are of the saturated type, and, in most cases, of a molecular weight of about 2000. They are prepared by conventional methods from adipic acid and glycols such as ethyleneglycol and diethyleneglycol. By 1956 and 1957, polypropyleneetherglycols and triols, shortly called polyethers, with an equivalent weight of about 1000 per hydrolyl function, had started to come into general usage.

Generally, polyesters can be foamed by either the one shot or the prepolymer method. However, in most cases, the first method is preferred because of its greater simplicity. Polyethers do not easily lend themselves to the one shot method without drastic modifications. The one shot foaming involves simply mixing the polyester, polyisocyanate, water, catalyst and emulsifier at room or slightly elevated temperatures. Efficient mixers operating at high speed are needed for this. Metering and mixing of the ingredients is continuous or intermittent. The foaming process begins within a few seconds after the foam mixture is discharged into a pan or mold.

The prepolymer method follows the same pattern although sometimes no polyisocyanate is blended into the foam mixture. However, prior to the mixing, the prepolymer is prepared by reacting polypropyleneetherglycols or triols with tolylenediisocyanate by application of heat. This prepolymer is charged into the mixer, taking the place of the polyester in the one shot method. The prepolymer is made batchwise, and it is foamed after shorter or longer periods of storage. In most cases, since the prepolymer contains a large excess of polyisocyanate, only a small amount or no additional isocyanate must be blended for the actual foaming step.

Source of the Foaming Reaction

The main chemical reaction which takes place during the foaming is the reaction between NCO groups and water. The NCO groups are supplied by either the unreacted polyisocyanate molecules themselves or by polyisocyanate attached to the prepolymeric structure. By this reaction, CO_2 is evolved while simultaneously two NCO groups form one urea linkage. If the one shot method is used, the NCO of the polyisocyanate also reacts with the hydroxyl groups of the polyester, under formation of urethanes. It is apparent that a high polymeric structure is the result in both cases.

If the foam is to be stable during rise the CO_2 evolution must proceed at a rate about equal to the formation of the high polymer. This balance is disturbed if the CO_2 evolution is either too fast or too slow in relation to the urethane forming reaction. Due to slow reacting hydroxyl groups, the urethane forming reaction is impeded in polypropyleneetherglycols and for this reason, the prepolymer method must be employed.

The relation between CO_2 evolution and high poly-

A new method for the production of urethane foams offers practical advantages:

- ***A wide range of compression load can be obtained without changing the resin***
- ***Very low density foams can be prepared more easily than with other methods***
- ***The exotherm produced by the foaming reaction can be reduced***

mer formation will also be unbalanced if the NCO attached to the prepolymeric structure reacts considerably slower with water than the portion of the NCO which is present in the free polyisocyanate. This seems to be realized to a moderate degree when tolylenediisocyanate is used in preparing a prepolymer since the ratio of slow reacting NCO in the 2 and 6 positions and the NCO in the more reactive 4 position is different for free tolylenediisocyanate and for tolylenediisocyanate attached to the prepolymeric structure respectively.

The density of the resulting foam is determined by how much CO_2 is evolved and consequently how many urea linkages are formed. However, the physical properties of the foam, particularly compression load properties (loadbearing), rebound and general "feel" of the material, are determined also to a large degree by the amount of urea groups. Consequently, the choice of a particular density narrows the range of physical properties obtainable with a given resin. Therefore, it was our objective to overcome this limitation of a fixed urea content for a given density and thereby produce foams of a wide range of properties. By doing so, it was possible to demonstrate the influence of urea groups on physical properties. This influence was disguised before by varying densities which did not allow the comparison of foams having the same density but different urea content.

Evaluation of Experimental Possibilities

The experiments have been restricted to attempts to decrease the amount of urea for a given density rather than to increase this amount. Experience has indicated that better physical properties might be expected from lower urea content. Different experimental possibilities have been considered. The first was foaming at elevated temperatures. A given amount of CO_2 will occupy a larger volume at higher temperatures, thereby requiring less urea groups for a particular density. This approach did not prove promising because of the high temperature necessary to produce a marked effect and also because of the greater instability of the foam during rise at higher temperatures.

The second was to lower pressure during rise of the foam, causing the CO_2 to expand also. Simple experiments were undertaken using a large desiccator, vacuummeter, vacuum storage bottle and water jet pump. The foam mixture was prepared by a continuous metering and mixing machine and then transferred as fast as possible into the desiccator which was evacuated while the foam was rising. In order to prevent collapse or splitting, the evacuation had to follow a pre-established pattern. It proved best not to exceed a maximum vacuum and also to apply only part of the vacuum immediately and the other part continuously as the foam was rising. A formulation yielding four pounds per cubic foot of foam at atmospheric pressure resulted, for instance, in foam of only two pounds per cubic foot. However, on a commercial scale, a process of this nature for slab stock would involve the use of very large vacuum chambers and other capital equipment.

As a third possibility, the blending of a volatilizable liquid into the foam mixture has been investigated. Here the foam is expanded in part by liquids which are volatilized by the exothermic heat generated during foaming. The third possibility, apparently the simplest for large scale operation, depends on whether suitable liquids can be found. The liquid should interact chemically or physically as little as possible with the foam except in the blowing action itself. As previously discussed, there also should be a suitable

TABLE I—PROPERTIES OF FOAMS MADE WITH POLYESTER MULTRON 18

Formulation	1	2	3
	Parts by weight		
Polyester Multron R-18	100.0	100.0	100.0
Tolylenediisocyanate isomer ratio 2, 4 to 2, 6, 65/35	30.0	27.5	46.0
Freon 11	13.5	0.0	0.0
Activator mixture	8.5	6.5	7.6
Consisting of:			
N-Ethyl-Morpholine	4.0	3.0	2.5
Water	1.8	1.5	3.2
Emulsifier	2.7	2.0	1.9
Density (lb./cu. ft.)	1.9–2.1	4.0	2.1 –2.2
Tensile Strength (psi.)	5–10	30–35	17–24
Tensile Elongation (%)	100–200	250–350	150–250
Compression Set (%)			
Method A	4–6	3–6	About 8
Load Deflection (psi.)			
Method B 25% Deflection	0.2–0.3	0.75–0.90	0.65–0.80
Average Cell Diameter (in.)	0.01–0.02	Very small	Small

Formulation	1	2
	Parts by weight	
Polyester Multron R-18	100.0	100.0
Tolylenediisocyanate isomer ratio 2.4 to 2.6, 65/35	43.0	46.0
Freon 11	22.0	0.0
Activator mixture	6.6	7.8
Consisting of:		
Diethyletherolamine	1.6	1.8
Water	3.0	3.2
Emulsifier	2.0	2.8
Density (lb./cu. ft.)	1.2–1.4	2.1–2.2
Tensile Strength (psi.)	13–16	20–27
Tensile Elongation (%)	175–225	175–225
Compression Set (%)		
Method A	14–35	10–18
Load Deflection (psi.)		
Method B, 25% Deflection	0.1–0.2	0.7–0.85
Average Cell Diameter (in.)	0.03	0.025

balance between the gas generating action and the forming of the high polymer. The liquid should be odor free, non-toxic, non-flammable and should also be readily metered and handled. Low molecular weight is required for high expansion per unit weight. In cases where the cooling effect is not an objective, low heat of evaporation will be desirable. The boiling points were expected to be preferably between 10°C. and 30°C. Actual evaluation of different liquids showed 20°C. and 30°C. to be closer.

Results with Liquids Tested

The liquids evaluated include among others acetone (bp. 56.3°C.), pentane (bp. 36.2°C.), ethylether (bp. 34.6°C.), trichloromonofluoromethane (bp. 23.77°C.) and dichlorotetrafluoroethane (bp. 3.55°C.). The trichloromonofluoromethane proved to be outstanding in over-all performance. Judging from the extent of the blowing action this compound evaporates to 70% or more in polyester one shot formulations as long as the cellsize is larger than about 0.022-inch. No chemical interaction is noticeable and there is no appreciable change in the surface properties of the system polymer — CO_2. Also the balance between gas generating action and high polymer formation appears to be undisturbed. Other advantages are its non-toxicity and non-flammability.

Acetone was not very effective in the blowing action because of a too high boiling point and high solubility in the finished polymer, which also causes the acetone to leave the finished foam slowly. Ethylether has a strong physiological effect and is highly flammable. Pentane alters the surface properties of the foam during rise, particularly in one shot polyester systems, but also in polyether prepolymer systems. Very small amounts in polyester systems cause enlarging of the cellsize. Larger amounts cause a boiling-like effect to take place.

Dichlorotetrafluoroethane when injected into the mixing chamber evaporates too rapidly due to its relatively low boiling point and large bubbles form which interrupt the outflowing stream of the foam mixture. However, a small amount—1% or less—does not show this effect. The preferred trichloromonofluoromethane (Freon 11, E. I. du Pont de Nemours Co.) posed a problem in achieving sufficient mixing to obtain a small even cell structure. This was overcome in some cases by blending the Freon 11 with the tolylenediisocyanate prior to feeding it into the mixing chamber. Since the tolylenediisocyanate is the better solvent, proper mixing is facilitated.

Generally speaking the stability of the foam during rise decreases with the addition of increasing amounts of Freon 11. Since the stability depends to a great degree on the surface properties of the cell walls, which can be influenced by the emulsifiers and catalysts used, it is often required to vary and change these ingredients in order to stabilize foams prepared with Freon 11.

Another limit concerning the maximum amount of Freon 11 is posed by the exotherm needed to evaporate a given quantity of Freon 11. The available exothermic heat is predetermined by the amount of water reacted with polyisocyanate and, in case of a polyester one shot system, also by the hydroxyl number of the resin. However, these limitations imposed by foam stability and exothermic heat are not severe in one shot formulations of polyesters. This is shown by the fact that of the polyester resins investigated which showed good stability when used without Freon 11, all were easily adopted to the incorporation of at least 5 to 15% of Freon 11 (based on resin = 100) without loosing this stability. The available exotherm effected satisfactory blowing action even in a formulation with 12% Freon 11 and as little as 1.5% water, a hydroxyl number of 60 and stoechiometric amounts of tolylenediisocyanate.

In a prepolymer formulation the maximum Freon 11 content must be lower in order to compensate for the smaller exotherm in prepolymers caused by prereacting the hydroxyl groups with polyisocyanate. To date the polyether prepolymers on the market and

the formulations recommended for them have not proven to be fully satisfactory in combination with volatilizable, organic liquids in amounts above 5% because of lack in stability. With increasing water and tolylenediisocyanate content, the maximum permissible amount of Freon 11 in both polyester one shot and polyether prepolymer systems does not change as much as would be expected judging from the greater exotherm alone because decreasing stability inherent in higher water, isocyanate and Freon content has a counterbalancing effect. The more linear the structure of the resin the more difficult the question of stability seemingly becomes.

Flexible-Type Resins Investigated

The resins investigated were preferably of the flexible type and included the polyesters Multron R-18, Multron R-68 (Mobay Chemical Co.) and Selectron 6201 (Pittsburgh Plate Glass Co.). Multron R-18 is a saturated, slightly branched polyester of the adipic acid type with a molecular weight of about 2000. Multron R-68 is of the same type but slightly less branched. Data on physical properties of the foams prepared from R-18 and R-68 are given in Tables I and II. Polyether prepolymers F-50 and PG-44 (Mobay Chemical Co.) were used in addition to other polyether prepolymers which were prepared in our laboratory.

The reason for preferring resins which yield flexible type foams when used with tolylenediisocyanate was that the softening effect brought about by the volatile liquid appeared to be most desirable in this type foam. Only Freon 11 is considered in the following formulations since it has the greatest practical interest. Freon 11 is mixed either into the tolylenediisocyanate or the catalyst and the mixture is fed and metered together to the mixing chamber. A so-called "activator mixture" is prepared which consists of catalysts, emulsifiers and water and this mixture is also fed and metered as a unit.

In order to start the foaming, the mixing of all the components takes place in a vertical, cylindrical barrel of 3 to 5 inches in length and 2 inches in diameter. Inside the barrel there is a rotating shaft with horizontal pins, which turns at a speed of 3,000 to 5,000 rpm. The inlets and the outlet are on the upper and lower end of the barrel respectively. The test data given with the formulations have been obtained by following the "Tentative Specifications and Methods of Test for Flexible Urethane Foams" by the Society of Plastics Industry, issued on June 4, 1956.

Beside the formulations and test data for foams prepared with Freon (Formulation 1), for comparison formulations and test data on foams made without Freon are given (Formulations 2 and 3). Formulation 2 is very similar to 1 except that Freon is omitted, which results in a foam of higher density. Formulation 3 is still basically like 1 but the water and tolylenediisocyanate contents are increased to yield a foam of the same density as that prepared by Formulation 1.

Tensile strengths of foams expanded with Freon are in many cases lower than those without expansion and also lower than tensile strengths of foams made to the same density with additional amounts of water and tolylenediisocyanate. The greater the blowing action the greater becomes this difference in tensile strength. The compression load follows the same pattern, only more pronounced. Compression set is largely unpredictable and depends to a great degree on the nature of the catalyst. While the influences on the physical properties mentioned above hold for polyester foams, not enough data have as yet been collected for polyether prepolymers.

TABLE II—PROPERTIES OF FOAMS MADE WITH POLYESTER MULTRON R-68

Formulation	1	2	3
	Parts by weight		
Polyester Multron R-68	100.0	100.0	100.0
Tolylenediisocyanate isomer ratio 2, 4 to 2, 6 80/20	27.0	24.0	47.0
Freon 11	12.0	0.0	0.0
Activator mixture	9.2	8.0	8.6
Consisting of:			
N.-Ethyl-Morpholine	5.0	4.0	2.4
Water	1.8	1.5	3.5
Emulsifier	2.4	2.5	2.7
Density (lb./cu. ft.)	2.0–2.3	4.0	2.0 –2.1
Tensile Strength (psi.)	18–22	20–30	25–30
Tensile Elongation (%)	500–600	300–400	200–300
Compression Set (%)			
Method A	10–20	2–6	10–20
Load Deflection (psi.)			
Method B, 25% Deflection	0.2–0.3	0.80–0.85	0.55–0.65
Average Cell Diameter (in.)	0.03	Very small	Small

Advantages of Using Volatile Liquids

The use of volatile liquids has particular advantages in three practical cases. First—it is possible to produce foam of lower compression load without having to change the resin. By combining different starting formulations, particularly different water contents, with different amounts of volatile liquids a wide range of compression load can be obtained, wider than by changing the resin alone.

Second—very low density foams can be prepared more easily since Freon 11 may render polyester formulations less unstable than such amounts of water and tolylenediisocyanate which would be equivalent in blowing action. This applies to starting formulations giving foams of two pounds per cubic foot or less in free rise.

Third—the exotherm produced by the foaming reaction can be reduced, particularly in rigid type foams where high exotherm may cause voiding and charring.

This brief description of the new method may give an indication of the range of formulations and foam properties possible by employing volatile liquids. Careful formulation work, however, is necessary in order to obtain maximum stability during foam rise and optimum physical properties in the finished product.

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FIG. 1—Fork truck handling a unitized load of carbon black. The cardboard pallet for facilitating handling comes with the load without charge.

Efficient Handling of Carbon Black Shipments

Unitized loading represents a great forward step in handling and warehousing this essential commodity

EFFICIENT loading and shipping, particularly of a low-density material like carbon black, can effect important economies for both shipper and receiver. To realize these economies requires special consideration of unit loads and their design to speed handling, to utilize space in cars or trucks effectively and to provide users with units that can be easily handled, stored and used in the consuming plant. Recent studies have shown how this can be accomplished.

Unitizing loads of carbon blacks represents a great forward step in service to the customer in handling and warehousing of an essential commodity. But, to do this efficiently is not a simple matter. Shipments by rail boxcar and by truck trailer require the design of unit loads which function to best advantage in both.

This effective way of loading carbon blacks can be achieved in either of two ways, by assembling the bags into unitized loads, or by using telescopic cartons. In assembling a unitized load a number of bags are piled onto a pallet in a predetermined pattern and held together by glue. A cardboard pallet, called a unit pad, for placement under the load is supplied free of charge. Figure 1 shows a unitized load of carbon black with its unit pad underneath being handled by a fork truck.

The second method involves placing the bags inside a telescopic carton. The best design for this carton has a length slightly less than half the width of a rail boxcar, and a width slightly less than half the width of a truck trailer.

Bags of unbeaded blacks do not lend themselves to shaping and gluing; they are best handled in the telescopic cartons. These hold as many as 40 to 42 bags and serve practically the same purposes as unitized loads of shaped bags of beaded blacks. Cartons can be readily handled on fork trucks in just the same way as unitized loads, and can be loaded in double tiers to get minimum-weight units into boxcars, and into trailers when headroom permits.

Arrangements of Unitized Loads in Differently Shaped Vehicles

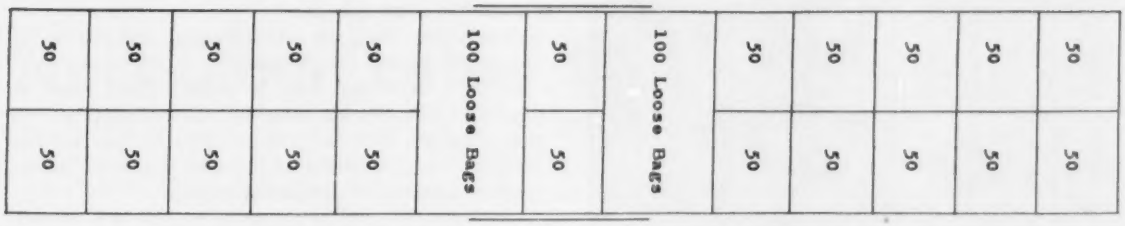

FIG. 2—Schematic diagram of the loading of a 50-foot boxcar with unitized loads of carbon black.

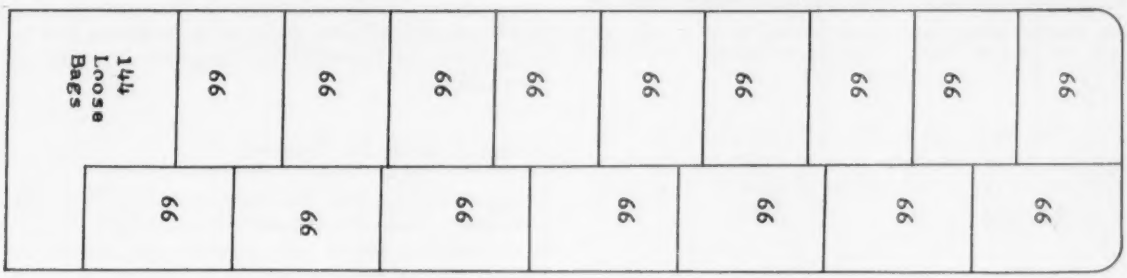

FIG. 3—Arrangement of unitized loads in a blunt-nose trailer with extra space filled by loose bags.

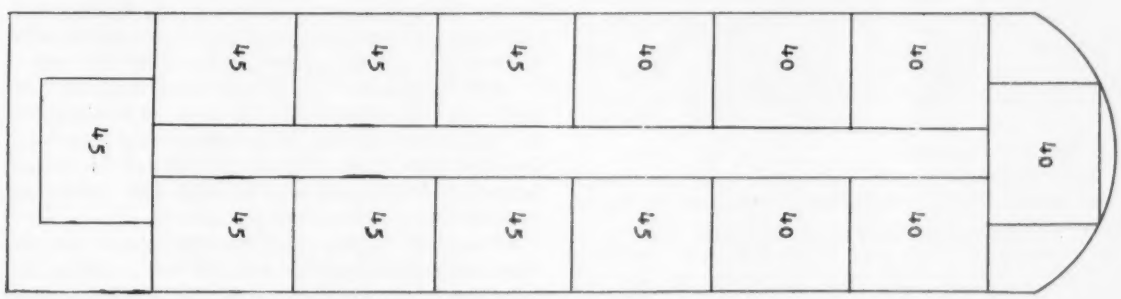

FIG. 4—Placement of 14 unitized loads in an arrangement suitable for either a blunt or round-nose trailer.

Designing the Unitized Load

For unitized loads of beaded blacks, bags must be designed to fit both in shape and size. Packed densities of various grades of black differ. For efficiency, bags must be designed to form tight rectangular patterns, leaving minimum air spaces. They must form both units of the size required, and patterns that interlock between tiers, or layers, for stability.

For best results, bags must be shaped or pressed before palletizing. Available equipment for doing this has been built, principally to handle fifty-pound bags that lend themselves best to square, tight units.

Bags are glued together in patterns to provide necessary stability. The glue used must be just right —strong in shear and weak in tensile—to prevent bags from slipping and yet to allow them to be separated without tearing. Because of this, bags should always be lifted vertically from a unit and never separated by sliding over one another.

Bag sizes to make ideal patterns and unit sizes

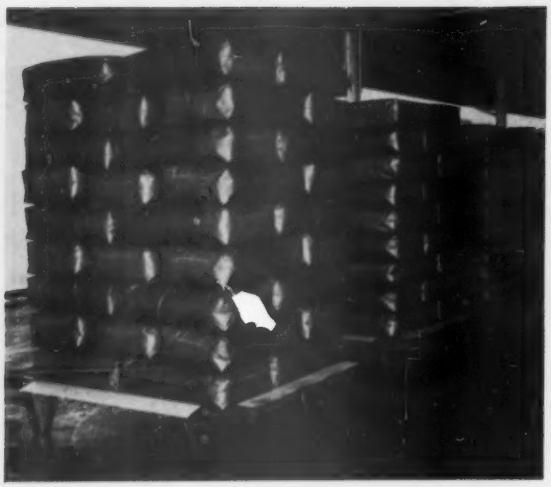

FIG. 5—Three unitized loads of carbon black in valve bags. The loads are straight (left), roller shaped (center) and roller pressed (right).

often leave some space over in the car or trailer. This space is filled with loose bags to make the shipment tight and to prevent distortion of units by rough handling or "humping" of cars. Or, if loose bags are not wanted, some units may be turned at right angles to fill the space by taking advantage of the different dimension of the pattern in the other direction.

Figures 2, 3 and 4 are schematic diagrams showing how differently shaped cars or trailers might be filled with unitized loads to best advantage. Figure 2 indicates the way a 50-foot boxcar might be packed with 22 of the unitized loads, each of which contains fifty 50-pound bags of black. Two hundred bags are stacked loose by the doors, making a tight load of 65,000 pounds. The two load units shown between the doors may be omitted if the car is unsuited for this type of placement.

The diagram in Figure 3 represents a 32-foot blunt nose trailer. Sixteen units, each containing sixty-six 25-pound bags, are arranged as indicated. Space for 144 loose bags is left over at the end of the trailer, making a total of 1200 bags or 30,000 pounds of carbon black which can be fitted into the space.

The arrangement shown in Figure 4 is applicable to either a blunt or round-nose trailer. Six units, each containing forty 50-pound bags, and eight units, each with forty-five 50-pound bags, are placed as the diagram indicates. This makes a total load of six hundred 50-pound bags, or of 30,000 pounds.

Limitations of the Unitized Load

Each customer has different conditions to be met:

(1) Double or triple stacking of units may be needed to fill warehouse space. The height of the units is limited by allowable height (which may accommodate one, two or three units) in the warehouse.

(2) Elevators or other obstructions on the route of the black in the customer's plant may limit the height of units.

(3) Since units must be handled with fork lift trucks, size and capacity of these may limit the weight and height of individual units. Fork lifts may be too light or too small to handle 2000 or 2500-pound units. Or the fork lift may be too high to get into a boxcar or a truck body.

In addition, there are other shipping and processing factors which must be considered:

(1) The individual bags of carbon black must be shaped. Units can be made up without shaping, but glue does not stick as well to surfaces that are not flattened and the height of the unit is greater by the greater thickness of unshaped bags.

(2) Since shaping is required to get best results, the customer must expect to find a small amount of fines caused by the pressing operation.

(3) The height of a platform may give the gangplank a difficult slope from a boxcar or trailer. This may require placing loose bags in the doorway of a boxcar or the end of a trailer to be removed first to make room for resetting the gangplank for most of the unloading.

Problem of Varying Bag Dimensions

Bag sizes, inherited from the past, come in dozens to fit today's line of blacks of different densities packed at different net weights. An industry-wide attempt in the last few years has sought to standardize sizes but the problem still remains. Valve bags complicated this picture by introducing a new set of dimensions, but valve bags produce the best units yet made, lending themselves better to shaped square corners (Figure 5). Sewn bags must be folded and taped into a tight unit, whereas valve bags lend themselves readily to unitizing without requiring these hand operations.

Fifty-pound bags form two standard units: 45 x 54 inches for low density blacks, and 40 x 48-inches for high density blacks. Five-bag layers are used exclusively with both. Twenty-five pound bags lend themselves to standard units of eight sizes, depending upon their sizes and number per layer.

Where unit heights must be kept so low that the minimum weight cannot be reached with a single layer in boxcar or truck, units can be double stacked with two cardboard unit pads (with lips turned away from each other to permit entry of the forks) placed between the units. The normal unit pad is heavy cardboard, usually with lips on two adjacent sides.

Unitizing, including an average number of cardboard pallets, is furnished at no added charge, the customer paying only for the additional pallets needed for double stacking. Many requests for special wooden pallets can be met, but only at a premium to cover the added cost. A few customers are willing to pay additional costs, but most lose interest when they learn of the extra charge.

Even though the expense of unitizing is reflected in costs, consumers find it well worthwhile for the combined savings it effects in labor of handling, and in full utilization of warehouse space. In all, it is a sound economy.

Deterioration of Neoprene-Coated Nylon Fabrics

Determining the minimum neoprene thickness necessary to protect nylon from weather and from sunlight

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ALTHOUGH beneficial to man, sunlight is not so kind to fabrics, especially if that fabric is nylon. Protection from sunlight exposure is therefore necessary, and a rubber base coating, generally of neoprene, is used. The results of exposure to weather at four different test stations, and exposure to artificial sunlight for 500 hours, indicate that nylon must have a coating of neoprene 6 to 8 mils in thickness to adequately protect the nylon from deterioration when it is exposed under extreme climatic conditions.

Coated cloth, and especially neoprene-coated cloth, is used by the U. S. Army Corps of Engineers in the construction of various pieces of equipment. The present work was instigated by reported failures of nylon cloths which had been thinly coated with neoprene. These failures occurred after exposure to sunlight. The theory was advanced that the coatings were so thin, either initially or after deterioration of surface film, that the base nylon cloth was no longer protected from the sunlight. It was also suggested that failure might have been caused by hydrochloric acid, released from the neoprene due to heat, which attacked the nylon cloth.

For some time, a correlation of natural and artificial weather deterioration has been desired. This investigation was initiated to determine the minimum neoprene thickness necessary to protect nylon from weather and sunlight. The coatings of different thicknesses consisted of both black and olive-drab compounds.

The two weights of nylon cloth used were similar in construction and physical characteristics to those used in 3-man pneumatic reconnaisance boats and 12-ton pneumatic half-pontons. Both these cloths are described in Table I.

TABLE I—NYLON FABRICS

	Light weight	Medium weight
Weight, ounces per square yard	2.3	6.75
Threads per inch	84 x 84	54 x 58
Weave	Plain	2 x 2 basket
Denier, units	116 x 116	210 x 210
Gauge, inches	0.0065	0.0160
Breaking strength, Grab Method, lbs.	Warp 110, Fill 150	Warp 440, Fill 460
Tearing strength, Tongue Method, lbs.	Warp 6, Fill 5	Warp 45, Fill 46

TABLE II—COATING COMPOUNDS

Ingredient	Black Parts by weight	Olive-drab Parts by weight
Neoprene GW	100.00	100.00
Accelerator	0.10	0.10
Neozone A	2.00	—
Antioxidant 2246	—	2.00
Stearic Acid	2.00	2.00
Petrolatum	2.00	2.00
Magnesia XLC	4.00	4.00
SRF Black (Pelletex)	54.00	—
Soft Clay (McNamee)	—	40.00
Hard Clay (Suprex)	—	40.00
Circo L.P. Oil	10.00	10.00
Zinc Oxide	5.00	5.00
Ferric Oxide (yellow)	—	19.50
HMF Black	—	2.75
Altax	1.00	1.00
Cure: Mins. @ 287°F.	45	60
Tensile strength, psi	2220	1810
Ultimate elongation, %	525	825

TABLE III—PROPERTIES OF UNCOATED AND COATED FABRICS

Code	Color	Coating Thickness each side, mils	Breaking Strength (Raveled strip) pounds Warp	Breaking Strength (Raveled strip) pounds Fill	Elongation at break, per cent Warp	Elongation at break, per cent Fill	Tearing Strength (Tongue) pounds Warp	Tearing Strength (Tongue) pounds Fill
		2.3 Ounce Fabric						
——	Uncoated		115	105	25	35	9.2	8.8
8335	Black	0.7	125	120	25	35	2.6	2.8
8336	Black	1.5	130	120	25	40	2.9	2.8
8337	Black	3.3	125	125	25	45	3.0	2.9
8338	Black	5.5	125	130	25	45	2.9	3.1
8339	Olive-drab	0.5	130	115	25	35	4.2	4.1
8340	Olive-drab	1.0	130	125	30	40	4.3	4.1
8341	Olive-drab	3.3	135	130	30	45	4.5	4.2
8342	Olive-drab	5.3	140	130	30	45	4.8	4.5
		6.75 Ounce Fabric						
——	Uncoated		380	390	35	40	73.0	77.0
8343	Black	1.5	405	390	35	45	37.0	46.0
8344	Black	8.0	430	390	35	45	34.0	34.0
8345	Black	9.0	420	410	35	50	31.0	33.0
8346	Black	12.0	435	400	40	50	32.0	35.0
8347	Black	13.5	425	395	40	50	30.0	31.0
8348	Black	15.8	405	390	35	50	31.0	34.0
8349	Black	18.0	420	410	40	50	31.0	34.0
8350	Black	19.0	405	400	35	50	34.0	34.0
8351	Black	21.0	420	410	40	50	32.0	33.0
8352	Olive-drab	1.7	415	400	35	45	62.0	71.0
8353	Olive-drab	8.0	405	405	40	50	49.0	50.0
8354	Olive-drab	10.0	410	395	40	50	47.0	49.0
8355	Olive-drab	11.0	430	400	40	50	48.0	49.0
8356	Olive-drab	13.0	445	415	40	50	47.0	48.0
8357	Olive-drab	15.0	430	390	40	50	50.0	51.0
8358	Olive-drab	17.5	420	395	40	50	48.0	52.0
8359	Olive-drab	19.0	430	400	35	55	49.0	52.0
8360	Olive-drab	20.5	435	400	40	55	50.0	51.0

The nylon cloths, coated to various thicknesses with black or olive-drab neoprene compounds, were exposed both to artificial weathering and to natural weathering at four different test sites. The black neoprene coating compound was formulated to meet the military requirements for the coatings used on the 12-ton pneumatic half-pontons; the olive-drab compound was for the ones used on the 3-man pneumatic reconnaissance boats. The formulas for these compounds and the physical properties of press cured sheets are given in Table II.

In the fabrication of the coated cloths they were first impregnated with a mixture containing equal parts of MD1-50 (50% methylene bis 4 phenyl isocyanate and 50% ortho dichlorobenzene) and a neoprene cement. Samples 8335, 8339, 8343, and 8352 (Table III) were given this treatment only. Following this treatment, the lightweight fabrics were spread-coated on both sides with a black or olive drab compound to give four samples of each color. They were then cured in an open steam autoclave with a 45-minute rise to 270°F. followed by a 75-minute stand at 270° F. Similarly, the medium weight fabrics were calender coated and then cured with the same compounds of a black or olive drab coating to give nine samples of each color. The total coating thickness on each side of these samples is listed in Table III.

Natural Climatic Aging Conditions

In submitting the fabrics to natural climatic aging, four exposure stations were chosen to equate varied climatic conditions. They are as follows: (1) Ft. Belvoir, Virginia—semi-urban, temperate; (2) Yuma, Arizona—desert, temperate; (3) Ft. Churchill, Manitoba, Canada—arctic; (4) Coco Solo, Panama—tropic.

Sheets of uncoated and coated fabric were exposed under no tension facing the south for 3, 6, 12, 18, and 24 months at all test sites. In order to determine whether deterioration would be greater in the folds of coated fabrics than in the flat sheets, additional specimens were exposed while wrapped over ½-inch dowels. The angles of exposure, determined by the latitudes of the test sites, were: 45 degrees to the vertical, Ft. Belvoir, Virginia and Yuma, Arizona; 30 degrees to the vertical, Ft. Churchill, Manitoba, Canada, and 80 degrees to the vertical, Coco Solo, Panama. The climatological data of the four exposure stations for each test period are given in Table IV.

For artificial aging, specimens of all uncoated and coated fabrics were exposed in a Type WX Weather-ometer (Atlas Electric Devices Co.) for 100, 200 and 500 hours. These exposures were as prescribed by Method 5804 of Federal Specification CCC-T-191 b "Textile Test Methods," except that alternate Corex D filters were removed during the test.

The weather exposed specimens were inspected

TABLE IV—CLIMATOLOGICAL DATA OF EXPOSURE STATIONS

Station	Average Daily Max. Temp., °F.	Average Daily Min. Temp., °F.	Average Daily Mean Temp., °F.	Average Daily Rel. Hum., %	Total Precip., in.	Total Int. of Radiation Gm. Cal.	Total Sun Hours
			3 Months				
Ft. Belvoir	49	32	40	63	6.47	21,000	474
Yuma	73	43	58	34	.38	34,200	780
Ft. Churchill	–6	–21	–14	67	4.57	7,600	279
Panama	85	77	81	78	8.53	49,000	522
			6 Months				
Ft. Belvoir	57	39	48	62	16.22	62,700	1166
Yuma	81	50	66	32	0.73	94,900	1880
Ft. Churchill	6	–9	–2	76	21.69	49,200	831
Panama	86	76	81	83	59.77	87,000	877
			12 Months				
Ft. Belvoir	68	49	58	64	28.78	139,500	2739
Yuma	90	60	75	34	1.35	206,400	4020
Ft. Churchill	27	12	20	81	28.79	106,900	1792
Panama	85	76	81	85	159.97	162,600	1873
			18 Months				
Ft. Belvoir	64	46	55	63	44.69	197,700	3879
Yuma	85	57	71	34	2.95	304,400	5905
Ft. Churchill	21	5	13	81	35.19	155,300	2595
Panama	86	76	81	84	202.86	252,700	3132
			24 Months				
Ft. Belvoir	67	49	58	65	72.82	268,500	5260
Yuma	87	60	74	34	5.63	418,500	8059
Ft. Churchill	28	13	21	82	57.41	209,600	3561
Panama	86	76	81	85	283.82	332,600	4309

TABLE V—PER CENT ELONGATION AT BREAK OF FOLDED SPECIMENS

Code	Color	Coating Gage Inch	Original BS	Original %E	Ft. Belvoir 3	Ft. Belvoir 6	Ft. Belvoir 12	Ft. Belvoir 18	Ft. Belvoir 24	Yuma 3	Yuma 6	Yuma 12	Yuma 18	Yuma 24	Ft. Churchill 3	Ft. Churchill 6	Ft. Churchill 12	Ft. Churchill 18	Ft. Churchill 24	Panama 3	Panama 6	Panama 12	Panama 18	Panama 24
							months					months					months					months		
										2.3 Ounce Fabric														
——		Uncoated	115	27	15	6	D	D	D	6	0	D	D	D	26	11	11	0	D	0	D	D	—	D
8335	Black	.0007	125	23	23	19	10	10	5	20	14	11	10	5	23	22	17	15	10	17	12	9	—	5
8336	Black	.0015	130	26	25	23	14	15	10	25	33	13	15	10	23	24	23	20	15	22	22	17	—	10
8337	Black	.0033	125	25	27	26	25	25	25	25	25	25	25	25	25	27	23	25	25	25	25	29	—	25
8338	Black	.0055	125	25	26	26	25	25	25	26	27	25	25	25	26	27	27	25	30	26	26	29	—	25
8339	Olive-drab	.0005	130	26	27	22	10	5	0	26	16	13	5	5	27	26	20	15	10	19	11	0	—	D
8340	Olive-drab	.0010	130	28	25	17	5	5	0	22	12	8	5	D	28	26	15	15	10	17	7	0	—	D
8341	Olive-drab	.0033	135	29	29	28	30	20	10	27	28	18	15	15	29	29	29	30	25	28	27	12	—	D
8342	Olive-drab	.0053	140	30	31	29	30	25	30	30	28	28	25	30	27	30	29	25	30	29	30	29	—	5
										6.75 Ounce Fabric														
——		Uncoated	380	37	22	16	0	0	0	20	6	11	0	D	33	23	17	15	5	15	4	0	—	D
8343	Black	.0015	405	35	31	25	20	20	25	28	22	17	20	10	32	29	25	25	25	28	21	21	—	10
8344	Black	.0080	430	34	34	34	33	35	35	33	32	32	35	30	36	32	33	35	30	29	32	36	—	30
8345	Black	.0090	420	37	30	33	34	35	35	34	32	33	35	25	35	33	33	35	35	29	30	33	—	30
8346	Black	.0120	435	38	34	33	34	35	35	34	32	34	35	30	—	28	33	35	35	29	33	34	—	30
8347	Black	.0135	425	38	35	36	34	35	35	36	34	34	35	30	37	33	33	35	35	28	34	35	—	35
8348	Black	.0158	405	35	36	34	33	35	35	35	32	36	35	30	35	34	34	35	35	—	30	36	—	35
8349	Black	.0180	420	38	35	34	34	35	35	—	33	35	35	30	—	34	33	35	35	28	30	36	—	35
8350	Black	.0190	405	35	37	35	36	35	35	35	30	34	35	30	—	35	33	—	40	30	30	37	—	30
8351	Black	.0210	420	38	—	34	32	35	35	38	28	34	35	30	—	33	33	35	35	28	31	36	—	30
8352	Olive-drab	.0017	415	36	27	21	10	5	0	25	18	13	10	5	30	26	21	20	15	17	12	3	—	D
8353	Olive-drab	.0080	405	39	33	35	37	35	—	36	33	34	—	—	37	32	34	35	—	—	—	—	—	—
8354	Olive-drab	.0100	410	38	35	35	36	35	35	36	34	33	35	30	37	33	33	35	35	29	32	34	—	—
8355	Olive-drab	.0110	430	38	—	34	32	35	35	37	33	33	35	30	37	33	33	35	35	30	31	34	—	35
8356	Olive-drab	.0130	445	38	34	36	34	35	35	37	35	38	35	35	36	34	36	35	35	—	—	—	—	—
8357	Olive-drab	.0150	430	39	35	37	35	35	—	38	35	36	—	—	34	33	33	35	—	—	—	—	—	—
8358	Olive-drab	.0175	420	39	—	—	33	35	35	37	33	39	35	35	—	—	33	35	35	32	33	33	—	35
8359	Olive-drab	.0190	430	36	32	34	33	35	35	36	33	34	35	30	—	—	33	35	35	—	—	—	—	—
8360	Olive-drab	.0205	435	38	33	37	36	35	35	—	32	37	35	35	—	—	35	35	40	—	—	—	—	—

monthly at each test station to note damage due to unusual weather such as windstorms or sandstorms. Both uncoated and coated nylon cloths were subjected to the tests listed below. These tests were performed initially, after exposure at each station and after artificial weathering, in both the warp and fill direction. The tests were performed by the methods described in Federal Specification CCC-T-191 b "Textile Test Methods." For breaking strength and elongation at break, the ravel strip method (5104) was adhered to; and, in determining the tearing strength, the tongue method (5134) was followed.

Definition of Values

The value recorded for each property was the average of at least five tests. The tearing strength values represented the strength of the cloths with the neoprene coatings. When it was found during the testing that the coating was not tearing but was exerting additional stress, the coating was cut with a razor to allow the base cloth to assume its normal tear.

The initial properties of the uncoated and coated cloths are listed in Table III. Retention of breaking strength and elongation and tearing strength after exposures are listed in Tables V, VI and VII. Retention of breaking strength and elongation after exposures of the folded specimens are given in Tables VIII and IX.

Decrease in breaking strength is commonly used as a criterion of depreciation of fabrics and coated cloths. In this work, elongations at break and tearing strengths were also tested. Both weights of uncoated cloth deteriorated rapidly and were almost valueless after only three months exposure at Yuma, Arizona, or Coco Solo, Panama. Impregnated and thinly coated cloths deteriorated steadily in all three physical attributes if the threads were exposed, or as soon as the neoprene coating, because of deterioration and attrition, thinned to the extent that it no longer offered protection.

The cloths with coatings of intermediate thicknesses retained almost all of their breaking strengths until crazing lines penetrated the coating either to or nearly to the cloth, then deterioration was rapid. If the coating was thick enough so that crazing did not penetrate, no significant loss in breaking strength was observed.

The elongation retentions followed the breaking strength retention pattern very closely, except that deterioration was not quite as severe. Although the tearing strength retentions followed the breaking strength pattern closely for uncoated and impregnated cloths, the tearing strength pattern changed for cloths with heavier coatings. Whereas the breaking strengths did not decrease if the coating was thick enough to offer protection, tearing strengths, regardless of coating thickness, declined gradually with time of exposure. Even where coating failure did not occur, and the breaking strength of the cloth remained unchanged during the two years exposure, the tearing strength declined 55 to 70% of its original value.

The loss of tearing strength, without loss of breaking strength, may be attributed to the increase in stiffness (modulus) of coating compounds. In

TABLE VI—RETENTION OF BREAKING STRENGTH (PER CENT)

(W = warp threads; F = fill threads; — = no sample for evaluation)

Code	Color	Coating Gage Inch	Ft. Belvoir 3 mo W	Ft. Belvoir 3 mo F	Ft. Belvoir 6 mo W	Ft. Belvoir 6 mo F	Ft. Belvoir 12 mo W	Ft. Belvoir 12 mo F	Ft. Belvoir 18 mo W	Ft. Belvoir 18 mo F	Ft. Belvoir 24 mo W	Ft. Belvoir 24 mo F	Yuma 3 mo W	Yuma 3 mo F	Yuma 6 mo W	Yuma 6 mo F	Yuma 12 mo W	Yuma 12 mo F	Yuma 18 mo W	Yuma 18 mo F	Yuma 24 mo W	Yuma 24 mo F
								2.3 Ounce Fabric														
—		Uncoated	55	55	15	10	0	0	0	0	0	0	25	25	5	5	0	0	0	0	0	0
8335	Black	.0007	95	55	65	40	35	25	30	15	20	5	75	40	50	20	35	15	25	15	20	5
8336	Black	.0015	100	85	85	65	50	50	40	20	25	25	90	70	75	50	45	35	35	30	25	25
8337	Black	.0033	105	105	100	100	95	90	95	90	90	75	95	95	100	100	95	95	95	90	95	90
8338	Black	.0055	100	95	95	95	95	95	95	90	95	85	95	95	100	100	100	100	95	90	95	85
8339	Olive-drab	.0005	85	75	85	45	20	5	5	0	0	0	80	50	60	30	30	15	15	0	0	0
8340	Olive-drab	.0010	90	55	60	25	15	5	5	0	0	0	75	45	45	15	25	10	20	0	0	0
8341	Olive-drab	.0033	95	90	100	95	90	55	55	20	20	5	90	95	95	80	60	30	35	15	25	5
8342	Olive-drab	.0053	105	100	95	100	95	95	95	95	90	45	95	95	100	100	95	70	80	65	65	30
								6.75 Ounce Fabric														
—		Uncoated	75	55	30	20	5	5	0	0	0	0	60	55	20	15	5	5	5	5	0	0
8343	Black	.0015	90	65	80	40	55	20	50	20	40	10	80	40	65	30	40	15	35	10	20	10
8344	Black	.0080	100	105	100	100	95	100	95	85	85	95	100	105	100	105	100	100	85	90	95	95
8345	Black	.0090	95	100	100	95	100	95	90	85	95	90	100	100	100	95	100	95	90	90	95	95
8346	Black	.0120	100	100	100	100	95	100	90	95	95	105	95	100	100	100	95	100	90	90	95	100
8347	Black	.0135	100	100	100	105	100	105	85	90	100	100	100	100	100	100	100	100	95	95	100	100
8348	Black	.0158	105	105	100	100	100	100	95	95	100	100	105	105	100	100	100	100	95	95	100	100
8349	Black	.0180	100	100	100	100	100	100	90	90	95	100	—	—	100	100	100	100	95	95	100	95
8350	Black	.0190	105	100	105	105	105	100	100	95	100	100	100	105	105	100	105	100	100	100	105	100
8351	Black	.0210	—	—	100	100	100	100	95	95	100	100	100	100	100	100	95	100	95	95	100	95
8352	Olive-drab	.0017	80	45	65	25	20	10	10	5	5	0	80	40	50	20	30	10	20	10	5	5
8353	Olive-drab	.0080	105	100	100	95	100	95	95	90	—	—	100	95	100	95	100	95	—	—	—	—
8354	Olive-drab	.0100	100	100	100	100	100	100	95	90	100	80	100	100	100	100	100	100	95	100	95	100
8355	Olive-drab	.0110	—	—	95	95	95	95	90	95	95	95	100	105	95	100	100	100	95	95	100	95
8356	Olive-drab	.0130	95	95	95	100	95	100	90	95	95	100	95	100	95	100	95	100	85	85	90	95
8357	Olive-drab	.0150	100	110	100	105	95	105	90	95	—	—	100	100	100	105	100	105	—	—	—	—
8358	Olive-drab	.0175	—	—	—	—	100	100	100	100	105	105	105	105	100	105	100	100	100	100	105	100
8359	Olive-drab	.0190	100	105	100	100	100	100	100	95	100	100	100	105	105	105	100	100	95	90	105	100
8360	Olive-drab	.0205	105	100	100	100	100	100	100	95	100	100	—	—	105	100	100	105	95	100	105	105

Code	Color	Coating Gage Inch	Ft. Churchill 3 mo W	Ft. Churchill 3 mo F	Ft. Churchill 6 mo W	Ft. Churchill 6 mo F	Ft. Churchill 12 mo W	Ft. Churchill 12 mo F	Ft. Churchill 18 mo W	Ft. Churchill 18 mo F	Ft. Churchill 24 mo W	Ft. Churchill 24 mo F	Panama 3 mo W	Panama 3 mo F	Panama 6 mo W	Panama 6 mo F	Panama 12 mo W	Panama 12 mo F	Panama 18 mo W	Panama 18 mo F	Panama 24 mo W	Panama 24 mo F	Accelerated Weathering 100 hrs W	Accelerated Weathering 100 hrs F	Accelerated Weathering 200 hrs W	Accelerated Weathering 200 hrs F	Accelerated Weathering 500 hrs W	Accelerated Weathering 500 hrs F
								2.3 Ounce Fabric																				
—		Uncoated	85	100	10	10	15	10	0	0	0	0	5	5	0	0	0	0			0	0	15	15	5	5	0	0
8335	Black	.0007	90	90	85	50	45	20	35	15	35	10	60	25	40	15	30	10			15	5	90	90	90	90	75	70
8336	Black	.0015	95	100	90	90	70	65	65	50	40	35	80	65	70	55	50	45			30	20	90	90	95	95	85	90
8337	Black	.0033	100	100	100	90	95	100	90	90	95	85	100	95	100	100	100	95			100	85	100	100	100	95	100	95
8338	Black	.0055	100	100	100	95	100	100	95	90	100	95	100	95	95	95	90	90			80	75	105	100	100	100	95	95
8339	Olive-drab	.0005	95	105	85	80	50	30	40	15	30	0	75	40	55	15	15	0			0	0	80	70	50	35	15	5
8340	Olive-drab	.0010	95	90	90	60	45	20	30	10	0	0	55	20	25	5	0	0			0	0	95	80	95	90	60	20
8341	Olive-drab	.0033	95	95	95	95	95	90	95	70	70	30	95	90	95	75	30	10			0	0	95	100	100	90	95	95
8342	Olive-drab	.0053	95	95	100	95	95	95	90	95	95	95	95	95	95	95	95	90			35	5	95	95	100	85	95	95
								6.75 Ounce Fabric																				
—		Uncoated	95	95	80	60	40	30	30	20	15	10	30	25	5	0	5	0			0	0	30	35	15	15	5	5
8343	Black	.0015	95	75	75	45	60	30	60	30	55	25	70	30	55	20	45	15			30	5	95	45	75	35	60	30
8344	Black	.0080	100	105	95	100	95	100	95	100	95	100	100	100	100	100	100	100			90	95	100	105	95	100	90	90
8345	Black	.0090	100	100	100	100	100	100	90	95	90	90	100	100	95	95	95	90			90	90	100	100	100	100	95	90
8346	Black	.0120	—	—	95	95	100	100	95	95	95	100	100	100	95	100	95	95			90	90	95	100	95	100	95	95
8347	Black	.0135	100	100	95	100	100	105	90	90	95	95	95	100	95	100	95	100			95	95	100	100	95	100	95	90
8348	Black	.0158	100	100	100	100	100	105	95	100	100	100	—	—	100	100	100	100			100	95	105	100	105	100	100	100
8349	Black	.0180	—	—	100	95	100	100	95	90	95	100	95	95	95	95	95	95			95	95	100	100	100	95	95	90
8350	Black	.0190	—	—	100	95	105	105	—	—	100	100	105	95	105	100	100	100			95	95	105	105	100	100	100	100
8351	Black	.0210	—	—	100	100	100	100	100	95	100	95	100	100	100	100	100	100			95	95	100	100	100	100	100	95
8352	Olive-drab	.0017	95	60	80	35	50	20	35	15	20	10	60	20	30	10	5	0			0	0	50	45	50	25	25	5
8353	Olive-drab	.0080	100	100	100	95	100	95	100	85	—	—	—	—	—	—	—	—			—	—	100	100	100	95	95	90
8354	Olive-drab	.0100	100	100	100	95	100	100	95	95	95	95	100	100	100	100	100	100			—	—	95	100	100	100	95	95
8355	Olive-drab	.0110	95	100	90	100	100	100	90	90	90	95	100	100	100	100	100	100			90	90	100	95	100	95	95	90
8356	Olive-drab	.0130	95	95	95	95	95	100	90	90	90	95	—	—	—	—	—	—			—	—	95	100	95	100	95	95
8357	Olive-drab	.0150	100	105	100	105	95	95	95	100	—	—	—	—	—	—	—	—			—	—	—	—	—	—	—	—
8358	Olive-drab	.0175	—	—	—	—	100	100	100	95	100	100	105	100	100	100	100	100			95	95	95	105	95	105	100	100
8359	Olive-drab	.0190	—	—	—	—	105	100	95	95	95	100	—	—	—	—	—	—			—	—	105	100	105	105	100	95
8360	Olive-drab	.0205	—	—	—	—	100	105	95	95	95	100	—	—	—	—	—	—			—	—	105	95	105	95	100	95

TABLE VII—RETENTION OF ELONGATION AT BREAK (PER CENT)

(W = warp threads; F = fill threads; — = no sample for evaluation)

Code	Color	Coating Gage Inch	Ft. Belvoir 3 mo W	Ft. Belvoir 3 mo F	Ft. Belvoir 6 mo W	Ft. Belvoir 6 mo F	Ft. Belvoir 12 mo W	Ft. Belvoir 12 mo F	Ft. Belvoir 18 mo W	Ft. Belvoir 18 mo F	Ft. Belvoir 24 mo W	Ft. Belvoir 24 mo F	Yuma 3 mo W	Yuma 3 mo F	Yuma 6 mo W	Yuma 6 mo F	Yuma 12 mo W	Yuma 12 mo F	Yuma 18 mo W	Yuma 18 mo F	Yuma 24 mo W	Yuma 24 mo F
									2.3 Ounce Fabric													
—		Uncoated	65	70	20	25	0	0	0	0	0	0	35	50	0	0	0	0	0	0	0	0
8335	Black	.0007	95	75	75	30	45	40	45	35	30	30	90	60	55	35	40	35	25	30	25	20
8336	Black	.0015	90	90	85	80	60	65	50	60	25	40	90	90	75	75	50	55	40	50	35	45
8337	Black	.0033	100	95	95	100	100	95	95	95	90	95	105	100	105	95	95	95	90	85	100	95
8338	Black	.0055	110	100	95	100	95	100	105	100	95	90	110	100	90	95	90	90	95	95	100	90
8339	Olive-drab	.0005	105	95	80	65	25	0	5	0	0	0	90	75	55	50	40	30	10	0	0	0
8340	Olive drab	.0010	80	75	55	45	15	0	5	0	0	0	80	60	45	35	30	15	25	0	0	0
8341	Olive-drab	.0033	105	105	95	100	80	65	55	40	15	10	105	110	95	80	60	45	45	40	25	10
8342	Olive-drab	.0053	105	105	95	100	90	100	90	95	90	70	105	110	95	95	80	75	75	75	65	45
									6.75 Ounce Fabric													
—		Uncoated	60	50	30	30	5	10	5	0	0	0	60	55	15	20	5	10	5	5	0	0
8343	Black	.0015	80	65	65	50	50	35	50	30	45	30	75	55	60	40	45	25	35	20	20	20
8344	Black	.0080	95	95	95	95	95	100	95	100	85	90	105	105	90	95	100	95	95	100	90	95
8345	Black	.0090	90	90	90	95	90	100	95	95	85	90	95	100	90	95	85	100	90	100	85	95
8346	Black	.0120	90	95	85	95	85	95	85	95	85	90	100	105	85	100	85	95	90	100	80	90
8347	Black	.0135	85	90	90	100	85	100	90	100	85	90	95	100	90	95	90	100	90	100	85	90
8348	Black	.0158	95	100	95	90	95	100	100	100	90	90	95	90	95	90	100	90	95	100	90	90
8349	Black	.0180	85	85	90	90	90	95	90	95	85	95	—	—	85	90	90	85	90	95	85	90
8350	Black	.0190	105	95	95	90	95	95	100	100	95	95	105	95	95	90	100	95	95	100	95	90
8351	Black	.0210	—	—	90	90	90	100	90	95	90	95	90	90	90	90	85	90	85	100	85	90
8352	Olive-drab	.0017	70	50	60	40	15	20	10	15	5	5	75	60	45	35	35	25	15	20	10	15
8353	Olive-drab	.0080	85	95	85	100	85	90	85	95	—	—	105	95	85	90	85	90	—	—	—	—
8354	Olive-drab	.0100	90	90	90	95	90	95	90	95	85	90	105	105	85	90	90	95	85	100	85	95
8355	Olive-drab	.0110	—	—	90	95	90	95	90	95	85	90	100	105	90	95	90	95	90	100	85	95
8356	Olive-drab	.0130	100	100	90	95	90	95	90	95	85	90	95	95	85	95	90	95	85	100	80	100
8357	Olive-drab	.0150	95	90	90	90	80	90	85	90	—	—	95	100	90	90	90	90	—	—	—	—
8358	Olive-drab	.0175	—	—	—	—	90	100	90	100	85	95	95	100	85	95	90	100	85	100	85	95
8359	Olive-drab	.0190	105	95	95	90	95	95	95	95	90	95	110	95	95	95	95	95	95	100	90	95
8360	Olive-drab	.0205	100	95	90	85	90	90	90	90	85	90	—	—	85	85	90	85	90	100	90	95

Code	Color	Coating Gage Inch	Ft. Churchill 3 mo W	Ft. Churchill 3 mo F	Ft. Churchill 6 mo W	Ft. Churchill 6 mo F	Ft. Churchill 12 mo W	Ft. Churchill 12 mo F	Ft. Churchill 18 mo W	Ft. Churchill 18 mo F	Ft. Churchill 24 mo W	Ft. Churchill 24 mo F	Panama 3 mo W	Panama 3 mo F	Panama 6 mo W	Panama 6 mo F	Panama 12 mo W	Panama 12 mo F	Panama 18 mo W	Panama 18 mo F	Panama 24 mo W	Panama 24 mo F	Accelerated Weathering 100 hr W	Accelerated Weathering 100 hr F	Accelerated Weathering 200 hr W	Accelerated Weathering 200 hr F	Accelerated Weathering 500 hr W	Accelerated Weathering 500 hr F
											2.3 Ounce Fabric																	
—		Uncoated	95	105	65	75	55	35	0	0	0	0	0	0	0	0	0	0			0	0	25	30	—	—	—	—
8335	Black	.0007	100	105	105	85	55	40	50	40	45	30	75	45	55	35	40	35			30	25	105	105	100	100	90	95
8336	Black	.0015	95	105	105	110	75	75	75	75	50	60	75	75	65	70	65	60			35	35	90	100	95	100	100	105
8337	Black	.0033	110	105	115	100	100	100	100	100	100	80	100	95	100	95	95	95			100	85	105	105	100	95	110	100
8338	Black	.0055	115	115	110	100	105	95	100	100	110	95	110	95	100	95	110	95			100	85	110	110	100	105	110	105
8339	Olive-drab	.0005	105	105	95	95	55	55	55	35	35	10	70	65	60	35	25	0			0	0	80	85	55	55	25	10
8340	Olive-drab	.0010	105	105	85	80	45	40	35	25	0	0	55	40	25	0	0	0			0	0	95	85	90	85	55	40
8341	Olive-drab	.0033	95	95	105	100	95	100	95	85	65	50	95	100	95	80	40	20			0	0	95	95	95	100	95	105
8342	Olive-drab	.0053	105	105	105	110	95	110	95	100	100	100	95	100	95	100	100	100			35	10	95	95	90	110	100	100
											6.75 Ounce Fabric																	
—		Uncoated	85	80	70	60	40	35	35	30	20	15	40	35	10	0	0	0			0	0	35	45	10	25	10	15
8343	Black	.0015	85	75	75	55	55	40	70	45	60	45	65	45	55	40	55	30			30	25	95	65	80	50	60	50
8344	Black	.0080	100	100	100	100	100	100	95	110	90	90	100	100	95	90	95	95			80	95	95	100	95	100	95	100
8345	Black	.0090	95	100	90	100	90	90	90	105	75	95	90	95	85	90	95	90			75	90	90	90	90	90	90	95
8346	Black	.0120	—	—	85	95	85	95	85	110	90	90	90	100	85	90	90	90			75	100	90	95	85	90	85	95
8347	Black	.0135	95	100	90	100	85	100	100	110	80	100	90	105	85	100	90	90			85	100	95	95	90	100	85	95
8348	Black	.0158	100	100	95	95	95	95	95	105	95	95	—	—	95	95	95	100			90	90	100	90	95	90	95	100
8349	Black	.0180	—	—	90	85	90	95	90	95	85	90	80	95	90	90	85	90			80	90	95	95	90	90	95	100
8350	Black	.0190	—	—	105	90	100	95	—	—	95	95	95	90	110	95	110	100			90	100	105	90	105	100	110	110
8351	Black	.0210	—	—	90	90	85	90	100	105	90	100	95	95	90	95	95	95			85	95	90	100	90	90	100	100
8352	Olive-drab	.0017	85	70	65	50	45	40	35	35	20	25	60	35	35	25	10	0			0	0	45	65	50	60	30	25
8353	Olive-drab	.0080	90	95	85	90	85	95	85	90	—	—	—	—	—	—	—	—			—	—	85	90	85	90	85	90
8354	Olive-drab	.0100	95	95	85	100	85	95	90	100	85	95	90	90	85	95	85	100			—	—	90	95	90	90	85	95
8355	Olive-drab	.0110	90	95	90	100	95	95	95	95	90	95	90	90	85	90	90	95			75	90	90	90	90	80	85	90
8356	Olive-drab	.0130	95	100	90	105	90	95	100	110	80	95	—	—	—	—	—	—			—	—	90	95	85	85	85	90
8357	Olive-drab	.0150	95	110	95	95	90	90	95	95	—	—	—	—	—	—	—	—			—	—	—	—	—	—	—	—
8358	Olive-drab	.0175	—	—	—	—	85	85	100	105	80	100	85	90	85	100	85	95			75	95	90	95	90	90	90	105
8359	Olive-drab	.0190	—	—	—	—	95	95	105	100	90	95	—	—	—	—	—	—			—	—	95	95	95	90	95	100
8360	Olive-drab	.0205	—	—	—	—	90	90	105	95	85	90	—	—	—	—	—	—			—	—	95	85	100	85	90	95

TABLE VIII—RETENTION OF TEAR STRENGTH (PER CENT)

(W = warp threads; F = fill threads; — = no sample for evaluation; N. T. = no test, tears only in fill direction)

Code	Color	Coating: Gage Inch	Ft. Belvoir 3 mo. W	Ft. Belvoir 3 mo. F	Ft. Belvoir 6 mo. W	Ft. Belvoir 6 mo. F	Ft. Belvoir 12 mo. W	Ft. Belvoir 12 mo. F	Ft. Belvoir 18 mo. W	Ft. Belvoir 18 mo. F	Ft. Belvoir 24 mo. W	Ft. Belvoir 24 mo. F	Yuma 3 mo. W	Yuma 3 mo. F	Yuma 6 mo. W	Yuma 6 mo. F	Yuma 12 mo. W	Yuma 12 mo. F	Yuma 18 mo. W	Yuma 18 mo. F	Yuma 24 mo. W	Yuma 24 mo. F
								2.3 Ounce Fabric														
——		Uncoated	25	20	N.T.	5	0	0	0	0	0	0	10	5	N.T.	N.T.	0	0	0	0	0	0
8335	Black	.0007	110	75	100	55	75	30	N.T.	15	N.T.	10	105	55	N.T.	30	N.T.	20	N.T.	15	N.T.	5
8336	Black	.0015	95	95	95	90	90	70	75	70	60	40	95	85	90	80	95	60	80	50	75	50
8337	Black	.0033	100	95	95	95	85	85	90	90	85	75	90	90	85	85	85	80	75	70	85	70
8338	Black	.0055	100	95	100	95	85	75	95	85	95	75	100	85	85	85	85	75	85	75	90	70
8339	Olive-drab	.0005	95	85	90	60	N.T.	0	N.T.	0	0	0	95	75	N.T.	35	N.T.	5	N.T.	5	0	0
8340	Olive-drab	.0010	95	70	N.T.	30	N.T.	0	N.T.	0	0	0	90	60	N.T.	15	N.T.	0	N.T.	0	0	0
8341	Olive-drab	.0033	90	95	95	90	75	75	N.T.	50	N.T.	10	90	90	90	90	75	60	N.T.	35	N.T.	15
8342	Olive-drab	.0053	95	95	90	95	80	80	75	75	65	75	90	95	85	85	75	80	75	70	70	60
								6.75 Ounce Fabric														
——		Uncoated	45	40	N.T.	5	N.T.	0	N.T.	0	0	0	30	25	5	5	N.T.	0	N.T.	0	0	0
8343	Black	.0015	90	45	N.T.	30	N.T.	15	N.T.	10	N.T.	5	N.T.	35	N.T.	15	N.T.	10	N.T.	5	N.T.	5
8344	Black	.0080	85	95	80	90	65	70	65	70	60	60	80	80	75	80	70	70	70	75	60	60
8345	Black	.0090	95	95	85	90	75	70	75	75	75	65	85	80	85	80	75	65	75	80	70	65
8346	Black	.0120	90	90	90	85	70	70	75	70	70	60	80	85	80	75	80	75	75	70	65	60
8347	Black	.0135	95	100	90	95	75	75	80	85	75	80	90	95	85	85	85	95	85	85	70	70
8348	Black	.0158	95	95	90	90	85	80	75	80	75	70	90	90	85	85	85	80	80	80	70	65
8349	Black	.0180	95	100	95	95	85	85	90	85	75	75	—	—	90	85	85	85	85	85	60	70
8350	Black	.0190	90	95	90	95	75	80	75	80	65	70	85	90	80	85	75	75	75	90	60	70
8351	Black	.0210	—	—	90	95	80	80	80	80	75	75	90	95	90	95	80	85	80	90	70	70
8352	Olive-drab	.0017	N.T.	25	N.T.	15	N.T.	0	N.T.	0	N.T.	0	N.T.	25	N.T.	10	N.T.	5	N.T.	0	N.T.	5
8353	Olive-drab	.0080	95	95	85	85	70	70	65	65	—	—	80	80	80	80	70	70	—	—	—	—
8354	Olive-drab	.0100	95	95	85	90	75	75	70	70	60	65	85	90	85	85	75	75	70	70	60	60
8355	Olive-drab	.0110	—	—	90	90	75	75	75	75	65	65	85	90	80	85	70	70	75	75	60	55
8356	Olive-drab	.0130	95	100	85	90	75	75	75	75	70	65	85	90	85	90	70	70	70	75	60	60
8357	Olive-drab	.0150	80	85	80	90	70	75	70	80	—	0	80	80	80	80	70	70	—	—	—	—
8358	Olive-drab	.0175	—	—	—	—	75	75	75	75	70	65	85	85	85	80	75	75	80	75	65	60
8359	Olive-drab	.0190	100	90	90	90	80	80	70	75	70	65	85	90	85	85	70	75	80	75	65	60
8360	Olive-drab	.0205	100	100	85	90	80	80	70	80	70	65	—	—	80	85	75	75	80	75	60	65

Code	Color	Coating: Gage Inch	Ft. Churchill 3 mo. W	Ft. Churchill 3 mo. F	Ft. Churchill 6 mo. W	Ft. Churchill 6 mo. F	Ft. Churchill 12 mo. W	Ft. Churchill 12 mo. F	Ft. Churchill 18 mo. W	Ft. Churchill 18 mo. F	Ft. Churchill 24 mo. W	Ft. Churchill 24 mo. F	Panama 3 mo. W	Panama 3 mo. F	Panama 6 mo. W	Panama 6 mo. F	Panama 12 mo. W	Panama 12 mo. F	Panama 24 mo. W	Panama 24 mo. F	Accelerated Weathering 100 hr. W	Accelerated Weathering 100 hr. F	Accelerated Weathering 200 hr. W	Accelerated Weathering 200 hr. F	Accelerated Weathering 500 hr. W	Accelerated Weathering 500 hr. F
								2.3 Ounce Fabric																		
——		Uncoated	55	50	15	15	N.T.	0	0	0	0	0	N.T.	5	0	0	0	0	0	0	5	0	N.T.	0	0	0
8335	Black	.0007	110	95	100	75	90	30	N.T.	30	N.T.	20	N.T.	55	N.T.	35	N.T.	15	N.T.	5	100	95	110	80	90	70
8336	Black	.0015	95	95	95	90	85	80	90	80	85	65	105	95	100	75	95	70	N.T.	45	95	95	95	90	85	70
8337	Black	.0033	100	95	90	95	95	95	95	90	85	85	90	95	85	85	90	80	80	75	95	95	90	95	90	85
8338	Black	.0055	110	95	100	85	105	90	105	80	105	75	105	90	90	85	95	80	90	70	100	95	105	90	100	80
8339	Olive-drab	.0005	100	100	90	75	N.T.	25	N.T.	20	N.T.	0	90	55	N.T.	5	N.T.	10	0	0	95	65	N.T.	25	N.T.	5
8340	Olive-drab	.0010	100	100	85	75	N.T.	10	N.T.	5	0	0	N.T.	25	N.T.	5	N.T.	0	0	0	90	90	85	80	75	65
8341	Olive-drab	.0033	100	100	85	90	85	85	85	80	80	65	90	90	90	80	N.T.	40	0	0	95	95	90	85	80	75
8342	Olive-drab	.0053	100	95	90	90	85	85	85	85	75	75	90	90	80	80	75	75	N.T.	25	95	90	90	80	75	70
								6.75 Ounce Fabric																		
——		Uncoated	45	50	45	35	N.T.	10	N.T.	5	N.T.	5	20	10	N.T.	0	N.T.	0	0	0	15	15	5	5	N.T.	0
8343	Black	.0015	100	65	N.T.	35	N.T.	15	N.T.	15	N.T.	10	N.T.	30	N.T.	15	N.T.	10	N.T.	5	45	30	N.T.	25	N.T.	15
8344	Black	.0080	80	90	80	95	70	80	80	80	70	65	75	80	70	70	65	60	55	55	80	95	75	80	70	75
8345	Black	.0090	95	95	85	90	80	80	85	90	80	70	80	75	85	75	65	65	70	60	90	85	85	80	80	80
8346	Black	.0120	95	—	90	90	85	80	90	90	70	65	80	75	80	70	65	65	65	55	90	90	80	80	80	75
8347	Black	.0135	95	95	90	95	85	85	90	95	75	75	85	85	85	85	75	75	75	70	90	95	90	95	85	90
8348	Black	.0158	95	95	95	95	85	80	90	90	80	70	—	—	85	80	75	65	75	70	95	90	95	85	80	85
8349	Black	.0180	—	—	95	90	90	85	85	80	80	75	85	90	85	80	80	70	75	70	95	90	85	90	85	85
8350	Black	.0190	—	—	95	95	80	90	—	—	75	75	75	85	80	80	70	70	65	60	90	95	80	90	80	80
8351	Black	.0210	—	—	100	95	90	90	90	95	80	80	85	85	85	90	80	75	70	75	90	95	90	90	80	80
8352	Olive-drab	.0017	N.T.	35	N.T.	25	N.T.	10	N.T.	5	N.T.	5	N.T.	10	N.T.	5	N.T.	0	0	0	N.T.	15	N.T.	85	N.T.	5
8353	Olive-drab	.0080	90	90	90	90	75	75	75	75	—	—	—	—	—	—	—	—	—	—	85	85	75	75	65	70
8354	Olive-drab	.0100	95	90	100	100	80	80	80	80	70	70	85	85	80	80	70	75	—	—	85	90	80	80	70	75
8355	Olive-drab	.0110	90	90	90	95	70	75	80	80	70	70	80	85	80	80	70	70	65	55	90	95	75	80	70	75
8356	Olive-drab	.0130	95	90	95	95	75	75	85	85	70	70	—	—	—	—	—	—	—	—	85	90	80	80	75	75
8357	Olive-drab	.0150	90	90	90	95	70	70	80	80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8358	Olive-drab	.0175	—	—	—	—	80	75	85	80	70	70	85	85	85	80	75	70	70	60	90	75	85	85	80	75
8359	Olive-drab	.0190	—	—	—	—	80	80	80	80	70	70	—	—	—	—	—	—	—	—	90	85	90	85	75	75
8360	Olive-drab	.0205	—	—	—	—	75	80	80	80	70	70	—	—	—	—	—	—	—	—	90	85	85	85	75	80

normal tearing tests of uncoated cloths, one thread is broken at a time but adjacent threads reinforce the thread being broken. The extent of this reinforcement is dependent on the ability of the thread to adjust its position and assume part of the load. Thus, if it is able to move, the adjacent threads increase the tearing strength of the cloth.

Effect of Modulus of Coating Material

Coating the fabric usually decreases its tear resistance by restricting the movement of the threads. The higher the modulus of the coating material, the more the tearing strength is decreased due to greater restriction placed on the thread movement. During the weather exposures, radiation heat from the sun caused continued vulcanization, increasing the stiffness of the coating, and thus decreasing the tearing strength. The test sites in decreasing order of deteriorating influence are Coco Solo, Panama; Yuma, Arizona; Ft. Belvoir, Virginia, and Ft. Churchill, Canada.

The deterioration was greatest at Coco Solo, in spite of higher total radiation and hours of sunlight at Yuma. It was assumed deterioration was increased at Panama by rainfall, which washed away protective dusts and "chalked" coatings. Comparison of all data indicated that deterioration by 500 hours of artificial weathering was roughly equivalent to six months exposure at Coco Solo, Panama, 12 months exposure at Yuma, Arizona and at Ft. Belvoir, Virginia, or 18 months exposure at Ft. Churchill, Canada.

The deterioration of folded specimens (Tables VIII and IX) was no greater than the deterioration of flat specimens (warp specimens of Tables V and VI). The deterioration of folded specimens would have been expected to be more severe, since ozone cracking would have been pronounced, if natural rubber, styrene rubber or nitrile coatings had been used. With the neoprene compounds that were used, noticeable crazing occurred but these crazings penetrated to the fabric only when the coatings were thin.

The deteriorations of the fill threads were consistently greater than those of the warp threads. It appeared that this was caused by the greater amplitude of displacement of the fill threads in the weave of these two coated fabrics. The fill thread peaks extended beyond the warp threads so that, as the coating was removed by weather deterioration and water attrition, these peaks were exposed to sunlight first. The results indicate that a black coating 3.3 mils thick on light weight nylon gave adequate protection for two years.

In previous unpublished reports, we had recommended a six mil coating to allow a factor of safety for variations in compounding. However, work by the DuPont Co. on these materials exposed for three years in Florida indicated that deterioration progressed slowly in the third year. Therefore, allowing for variations in compounding and weathering, 4 to 5 mils of black neoprene coating on the lightweight nylon should be satisfactory for two years.

TABLE IX—RETENTION OF BREAKING STRENGTH OF FOLDED SPECIMENS (PER CENT)

(Warp Direction Only)

Code	Coating: Color	Coating: Gage Inch	Ft. Belvoir: 3	Ft. Belvoir: 6	Ft. Belvoir: 12 months	Ft. Belvoir: 18	Ft. Belvoir: 24	Yuma: 3	Yuma: 6	Yuma: 12 months	Yuma: 18	Yuma: 24	Ft. Churchill: 3	Ft. Churchill: 6	Ft. Churchill: 12 months	Ft. Churchill: 18	Ft. Churchill: 24	Panama: 3	Panama: 6 months	Panama: 12 months	Panama: 24
								2.3 Ounce Fabric													
8335	Uncoated		55	15	0	0	0	25	10	0	0	0	95	40	10	5	0	5	0	0	0
8336	Black	.0007	100	75	35	35	20	100	55	40	25	15	90	90	60	40	35	65	45	30	20
8337	Black	.0015	100	95	60	50	25	95	70	55	50	30	100	90	85	65	60	85	80	60	30
8338	Black	.0035	100	100	100	100	85	100	100	90	95	80	105	105	100	75	95	100	95	100	90
8339	Drab	.0055	100	105	95	100	95	105	105	105	100	85	105	100	100	85	100	100	105	110	95
8340	Drab	.0005	90	90	30	15	0	100	60	50	30	15	105	100	65	50	35	80	40	5	0
8341	Drab	.0010	95	60	20	10	0	80	45	35	20	0	105	100	65	35	30	60	110	0	0
8342	Drab	.0033	95	100	100	75	30	95	100	80	60	40	100	100	95	80	80	100	95	40	0
		.0053	95	95	95	95	95	95	100	100	95	90	100	95	95	80	80	95	95	100	20
								6.75 Ounce Fabric													
	Uncoated		75	40	5	5	0	55	15	5	5	0	100	75	40	30	15	35	10	0	0
8343	Black	.0015	95	90	60	55	50	90	80	45	40	30	95	95	80	75	65	80	70	55	35
8344	Black	.0080	100	100	95	95	90	100	100	100	100	95	100	100	95	95	95	95	95	95	90
8345	Black	.0090	95	105	95	100	95	100	100	100	100	80	100	95	100	95	100	100	90	100	95
8346	Black	.0120	95	100	95	95	90	100	95	95	90	80	100	90	95	95	95	95	95	95	95
8347	Black	.0135	100	100	95	100	95	100	100	100	85	85	100	95	95	95	95	95	95	100	95
8348	Black	.0158	105	105	100	100	100	100	100	100	90	90	100	100	100	100	105	100	95	100	95
8349	Black	.0180	100	100	100	100	95	—	95	100	95	90	100	—	—	—	—	100	90	100	95
8350	Black	.0190	105	105	95	100	100	105	95	105	95	90	—	—	100	—	—	100	95	100	95
8351	Black	.0210		100	95	100	100	100	95	100	95	85	—	—	95	—	—	100	95	105	95
8352	Drab	.0017	90	75	30	15	5	85	60	35	25	5	95	90	70	50	45	60	35	10	0
8353	Drab	.0080	100	100	95	100	—	100	100	100	—	—	100	100	100	100	—	—	—	—	—
8354	Drab	.0100	105	105	100	100	95	100	100	100	95	95	100	100	100	95	100	100	100	100	—
8355	Drab	.0110	—	100	95	95	95	100	100	100	100	95	100	100	100	95	100	100	100	100	—
8356	Drab	.0130	95	100	95	95	95	100	95	95	95	95	95	95	95	95	95	100	100	100	95
8357	Drab	.0150	100	100	95	95	—	95	100	100	—	—	95	100	100	95	—	—	—	—	—
8358	Drab	.0175	—	—	95	95	100	100	105	100	95	100	—	—	—	95	—	100	100	—	—
8359	Drab	.0190	95	100	95	95	95	100	100	100	100	100	—	—	100	95	100	100	100	100	100
8360	Drab	.0205	100	100	95	90	95	—	100	95	95	100	—	—	105	95	105	—	—	—	—

It is possible that a 5-mil coating would give adequate protection to the medium weight fabric. It might well be argued that the same protection should be required by both weights of fabric since the coating thickness was determined from the increase in thickness of the cloth. Thus, the coating on the least protected threads were measured in each case. However eight mils is the lightest coating tested which gave adequate protection.

An olive-drab coating 5.3 mils thick did not protect the light weight nylon cloth for two years. Unfortunately, no heavier coatings were tried. From extrapolation, the olive-drab coating requires 3.5 mils more than the black coating if ample protection is to be desired. Therefore, 8 to 10 mils of olive-drab coating would be required for two years of weathering.

The medium weight nylon cloth with 8-mil coatings retained practically all of its original breaking strength after submission to the various weather exposures. However, as mentioned before, the results on medium weight nylon with both 8 and 10-mil coatings were incomplete especially after 18 and 24 months exposure. Tear strength deteriorated far more seriously than the breaking strength. Specimens with coatings as thick as 12 mils retained only 55% of their initial tear resistance. Consequently, we have recommended that 8-mil black or 10-mil olive-drab neoprene coatings be applied to medium weight nylon fabric. Deterioration in ultimate elongation followed in general the deterioration in breaking strength. Specimens exposed while folded over a ½-inch dowel were the same as those exposed as extended sheets.

Summary

It is concluded that deterioration comparable to weather exposure of 6 to 12 months can be attained by artificially aging the specimens for 500 hours, and that properly compounded black neoprene coatings can be expected to afford adequate weather protection for two years if the coating for a light weight nylon is at least six mils thick. For a medium weight nylon, a coating of eight mils is necessary for adequate protection. However, non-black neoprene coatings, properly compounded, require a minimum of eight mils for two year protection of the light weight nylon and 10 mils for the medium weight nylon cloth.

Mill Roll Speed Ratios

By A. L. BACK

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THE RATIO of the speeds of the back and front rolls of a rubber mill, called friction ratio or roll surface friction, is a measure of the difference of peripheral velocities of the mill rolls. It is of interest to the rubber technologist to know how this ratio should vary among different size mills, taking as a basis a fixed peripheral velocity difference. For example, the technologist wants to know whether the differential roll velocity in the laboratory mill is the same as in the production unit. An equation is presented herewith for calculating the roll speed ratio for one mill which would give the same differential roll velocity as that on another mill having different roll speeds and (or) roll diameter.

For two different mills, designated by the subscripts "1" and "2", the relation between roll diameter (D), speed of front roll (S), and the ratio, speed of back roll/speed of front roll (R), is:

$$R_2 = \frac{D_1 S_1 (R_1 - 1)}{D_2 S_2} + 1.$$

For example, considering the values specified in ASTM D-15-54T for a laboratory mill,

$D_1 = 6$ inch outside diameter roll,
$S_1 = 24$ rpm speed, slow (front) roll, and
$R_1 = 1.4$ speed ratio, back to front rolls,

and substituting the numbers, the equation becomes:

$$R_2 = \frac{6 \times 24(1.4 - 1)}{D_2 S_2} + 1 = \frac{57.6}{D_2 S_2} + 1.$$

For mills having rolls six inches in diameter and larger, the following values of roll speed ratio, R_2, are computed to produce the same peripheral velocity difference as that corresponding to the above ASTM specifications for the six-inch diameter mill rolls:

Front Mill Roll Diam., in.	Roll Speed, rpm	Computed Speed Ratio, R_2	Front Mill Roll Diam., in.	Roll Speed, rpm	Computed Speed Ratio, R_2
6	24.0	1.400	18	18.5	1.173
8	23.0	1.313	20	18.0	1.160
10	22.0	1.262	22	17.0	1.154
12	21.0	1.228	24	16.0	1.150
14	20.0	1.206	26	15.0	1.148
16	19.5	1.185	28	14.0	1.147

Thus, if a 24-inch roll diameter factory mill operating at a 16-rpm front roll speed has a 1.20 friction ratio, the difference in peripheral speeds of the back and front rolls is greater than in the case of a laboratory mill operated according to ASTM specifications. If this ratio is reduced to 1.15, the peripheral speed difference would then be the same as in the laboratory mill.

The writer wishes to thank William J. C. Berry, E. I. du Pont de Nemours & Co., for his contribution to this work.

Two-piece Tire Tube Valves

FIG. 1—Value and spud used in off-the-road tubes.

The two-piece design offers:

Ease of handling

Reduction in production cost

Savings in inventory and maintenance downtime

TWO-PIECE tire tube valves first came into use five years ago, when conventional one-piece tire valves were proving unsatisfactory for large, off-the-road vehicles. Today, the use of two-piece tire tube valves not only sharply reduces dealer inventories, but allows tire manufacturers to realize substantial production savings on each tube manufactured.

O-ring two-piece tire valves were pioneered by Dill Manufacturing Co., Cleveland, Ohio. The advantages found in the use of this new type tire valving soon became apparent for on-the-road fleets, allowing owners to make substantial reductions in spare tire inventories.

As the use of two-piece tire valves on all types of rubber-tired vehicles becomes more prevalent, tire and tube manufacturers are reaping important benefits in the form of reduced production cost per unit manufactured. A two-piece tube valve eliminates vulcanization of the entire valve to the tube when the tube is manufactured. Instead, a small spud is vulcanized onto the tube. Valves in a wide variety of shapes and sizes can then be attached to the spud. The valve and spud assembly of a two-piece valve used for off-the-road vehicles is seen in Figure 1, and an assembly for truck tubes is seen in Figure 2. A schematic diagram is shown in Figure 3, which also depicts the straight and bend forms which are available for truck applications.

The valves come equipped with static O-ring seals, which retain air pressure even when the valve is rotated. The valve engages the spud by cone-shaped surfaces which seal even though the O-ring is not present.

The flexibility inherent in this system not only means ease of maintenance to the eventual user, but a savings of several cents per tube to the manufacturer during production. The spud has no flats and does not have to be indexed with the tube. It is put on as the tube leaves the extruder, while the tube is clean and hot, eliminating time-consuming use of patches to keep the valve area clean. This is possible because the spud is short, and will not be knocked loose during subsequent processing operations.

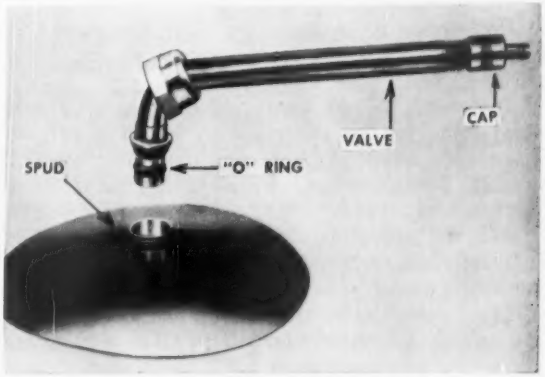


FIG. 2—Valve and spud assembly of a two-piece valve used on truck tubes.

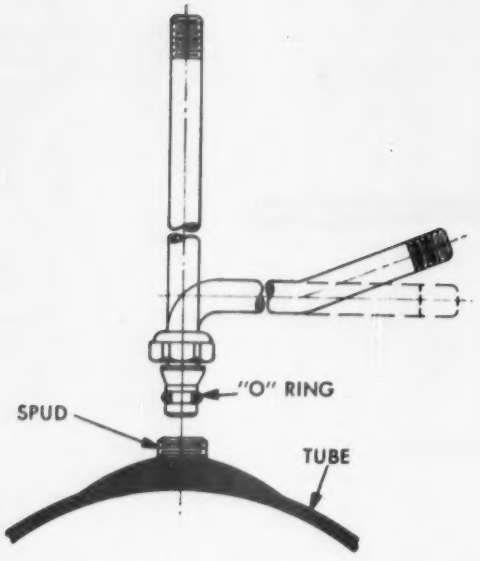


FIG. 3—Schematic of a two-piece truck tire valve which shows straight and bend forms available.

More economic stocking of in-process tubes is also possible. Storage trays or leaves will hold many times the number of tubes due to the short height of the spud.

With a two-piece truck valve, the operator does not have to handle hot connectors or screw assemblies to inflate the tube in the mold. A bayonet-type connection which is spring-loaded in the curing mold enters the spud and automatically makes the juncture. With the 5/16-inch hole through the spud, instead of the .110-inch hole found in a conventional one-piece valve, inflation and deflation in the mold can be quickly accomplished, reducing the curing cycle accordingly. Fast inflation also materially reduces a tendency toward thin spots in the tube due to high temperature before tube expansion.

In the process of vulcanizing one-piece valves to tubes, a certain number of valves are damaged, either in the molding process or in handling. With no valve on the tube during the manufacturing period, the problem is completely eliminated. And, of course, in any tube-production which is later consigned to scrap, only the relatively inexpensive spud is scrapped with the tube.

Similar cost savings can be realized in attaching valves to the spuds, once vulcanization is completed. Two-piece valves are shipped by valve manufacturers pre-bent, with valve cores inserted, thus eliminating two operations. In most cases the same operator who previously installed both the hex nut and bridge washer, installs the valve on the spud. Inflation for inspection is done through the spud to save time.

Elimination of special production runs and reduced inventory are other important considerations. When a tube manufacturer receives an order specifying special shape or length valves, use of the two-piece unit makes it unnecessary to make a special run through the tube molding operation. Specially shaped valves are simply and economically attached to spuds on standard, in-stock tubes.

To tube manufacturer and user alike, the two-piece valve represents a substantial advance in ease of handling, and a marked reduction in per unit production cost, inventory and maintenance downtime.

A Safety Problem: Epoxy Resins and Amine Curing Agents

THE RUBBER SECTION of the National Safety Council publishes *Safety News Letter*, a publication devoted to safety in rubber manufacturing plants. A recent issue contained an article by George L. Wilson, Industrial Hygienist for B. F. Goodrich Co., on the hazards associated with epoxy resins and amine curing agents.

The chief problems connected with the epoxies is skin irritation. The effect usually makes a delayed appearance, frequently after some months or weeks of contact, although primary irritation may occur. Some workers become sensitized and thereafter only a slight contact with epoxy materials or their vapors will cause a recurrence. Primary irritation and sensitization caused by these materials can be prevented by:

(1) Education: Workmen must be made aware of the hazards, and the measures to be taken to minimize them—the most important being to prevent all skin contact.

(2) Housekeeping: The storage and formulation of epoxies should be confined to an area used for no other work. Equipment should be used only for this work. Mixing should be done in disposable cardboard containers.

(3) Ventilation: Epoxies should be handled in areas having good ventilation. Local exhaust may be necessary where substantial quantities are handled, particularly if elevated temperatures are used.

(4) Personal Cleanliness: A thorough wash-up at the end of each work shift is a necessity. Organic solvents are *not* suitable for cleaning the skin. Clothing should be clean.

(5) Protective Creams and Clothing: A protective barrier cream on exposed portions of the body may be advisable. Gloves, aprons and coveralls should be worn.

The amine curing agents are highly caustic, and will cause severe burns on the skin, and serious damage to the eyes. In case of contact, the employee should be referred to a physician at once.

EDITORIALS

IN a recent canvass of Wichita, Kansas parking lots, 335 inspectors recently safety-checked the condition of more than 145,000 tires inaugurating a "Safe Tires Save Lives" program. Forty per cent of the 36,281 vehicles visually inspected were found to be running on unsafe tires. Experts indicated that if the ratios developed in the sweeping pilot study in Wichita held true for the nation, they would indicate that nearly 24 million automobiles in the United States are rolling on unsafe tires.

Inspectors found 31,054 unsafe tires on 15,280 vehicles, some exhibiting two or more unsafe conditions. The breakdown as to condition was: smooth tread, 16,077; uneven wear, 14,538; sidewall cracks, 5,158; cut or bruised, 1,302.

The Wichita program was sponsored by the Inter-Industry Highway Safety Committee in cooperation with the Wichita Tire Dealers Association, the Rubber Manufacturers Association, the Tire Retreading Institute, tire and cord manufacturers and the *Saturday Evening Post*. The sponsors of the program had a strong and enthusiastic assist from local civic authorities, school officials and the local press.

If one were to accept the results of the Wichita study at face value—and there is no reason why one should not—the fact remains that forty per cent of the vehicles operating in that city have unsafe tires. It is equally interesting to note that the major faults exhibited by the tires could not in any way be attributed to the manufacture of the tires.

Rather, those deficiencies which the tires exhibited apparently came about because of over-use, careless use, mchanical difficulties in the automobile which caused tires to wear unevenly, etc. Only in the "sidewall crack" category could there have been some element of doubt as to who was at fault—the tire or the driver.

At any rate, something must be done to impress upon the American motorist the dangers which exist in driving on unsafe tires. It is a poor kind of economy which may result in the loss of life. The rubber industry—the individual tire manufacturers—and the Rubber Manufacturers Association, among others, have much of which to be proud. The rubber industry has long been in the vanguard of the safe tire campaign and has done excellent work in this direction. It is difficult to think of any industry which has devoted so much of its time, energy and money to a similar cause.

Apparently, however, much remains to be done. When forty per cent of our people are driving about on unsafe tires there is something radically wrong. A little more than publicity is involved here, it is a question of education. All of us can contribute a little something —all of us must. By the way—what is the condition of your tires?

Safety Programs

for the Rubber Plant

By J. E. Bedford

Professor of Management,
Armstrong College, Berkeley, Calif.

A REVIEW of the safety record of any rubber plant will reveal that the accident rate goes down during a safety training program. It is held down immediately following the program. Then, suddenly accidents start to happen all over the plant. The accident rate will then be as high or higher than it was before the safety program was put into effect.

Why? Usually it is because the newness of the safety program has worn off around the plant. Workers and supervisors have fallen back into their old habits . . . they neglect to keep practicing the safety rules covered in the initial safety training program.

When the accident rate starts to climb, rubber plant management is apt to consider the safety program a waste of time and money and cast it aside. This may pare a few dollars from the evident overhead expense, but the hidden cost of accidents will remain—lost time, lower production, equipment repairs and lower employee morale.

Progressive rubber plant management does not stop the sales promotion and advertising program when business starts to decline. They put more effort into promotion. This may include more aggressive selling, sales contests, more extensive advertising, or offering extra commission to the salesmen.

Safety programs also need a "shot in the arm" to keep them at top efficiency and to hold the accident rate at a low level. Here are three ideas rubber plants have found helpful in promoting their safety programs.

(1) BULLETIN BOARDS

Safety posters can be purchased in quantity for use on company bulletin boards. However, this type of poster usually falls into a standard pattern. A check with the employees in a plant the day after the poster has been changed will not reveal much identification or interest. Workers form a habit of tuning out the standard safety poster just as they have learned to tune out radio and TV commercials.

Part of the reason for this lack of interest in the prepared safety posters is that they lack plant human interest. The people pictured on the poster are not known to the people in the rubber plant. The scenes illustrated may be for an accident in a steel mill or a canning factory, and lack the industry identification necessary for arousing the interest of employees who work in the rubber industry.

However, when this poster idea is changed to a poster of an accident in the plant in which it is displayed, or a photograph of one of the men actually working in that plant who has an enviable safety record is used, the workers will read and remember the safety poster. It will then have plant human interest.

Rubber factories that have adopted the use of safety posters make these recommendations:

(1) Change the posters frequently—at least every two weeks.

(2) Picture current accidents — not ancient history.

(3) Have the poster tell the story—who, what, why and how the accident could have been avoided.

(4) Keep copy on posters at a minimum—people do not have or take time to read a long message.

Three Safety Items Used in the Rubber Plant

Effective safety programs can bring home to the worker the wisdom of using protective clothing and safety devices

Safety goggles

Safety shoe

Safety hat

(2) PERSONAL LETTERS

Every time the safety record of an employee is reviewed, it is suggested that if he is a safe worker that he receive some kind of a personal letter from a top executive. This can be a short note of congratulations for going through a period—six months or a year —without an accident.

These letters can follow a form yet be made personal by a review of each individual's long standing safety record. If the employee received a safety letter a year ago, for instance, the second letter might start something like this:

"Last year when I wrote you about your fine safety record, I sincerely prayed that I would be able to send you another letter this year. You have gone two years without an accident! Congratulations, John."

Rubber plants with a limited number of regular employees have found that this form of stimulation is best when the letter is delivered to the home of the safety-minded worker. It helps the family realize how important safety is considered by the employer.

Larger plants have a more frequent system of writing to new employees. Statistics prove that new workers are more accident prone than older workers. Thus, new employees receive a letter when they start, and then another after a month, three months, six months, nine months, and one year. After this time the new worker is placed on the regular role of safe workers.

Another plan for these letters is to send them to all the employees in one department. Thus, the entire department is congratulated for its safety record and this establishes a form of rivalry among the different departments in achieving a top safety record.

Rubber plants using personal letters recommend the following rules:

(1) Do not use a mimeographed form letter—make it personal or do not send it.

(2) Tie-in with past safety letters to make the congratulations more personal and more sincere.

(3) Work out a system so that none of the employees are overlooked in this safety letter program.

An unusual example of recognition of a safety achievement was the presentation of key chains to the workers in two Firestone plants when they set world records for working more than six and seven million hours without lost-time accidents. The chain presented to each of the employees for this notable achievement is shown at the beginning of this article.

(3) CONTESTS AND DRAWINGS

Safety contests have been used in many plants with a wide variety of results. If the contest is successful in keeping the accident rate at zero for any period of time, employees tend to lose interest after a month and the value of the competition is lost.

However, if the accident rate is particularly high in a plant, the contest can be used for a short time to provide a means of getting things on a more even keel. Then, after the contest has run for thirty days, the awards can be made. This will eliminate the long drawn out waiting and the lack of interest that may develop.

Another form of contest that rubber plants have found successful is to have a weekly safety drawing. Management puts up a weekly safety award — $5, $10, $25, or whatever is in line with the number of employees in the plant and the seriousness of the accident rate. Each week the workers who have had sixty accident-free working days are entered in the drawing.

After a worker has had an accident, he must maintain a sixty-day safety record before he can participate in the weekly drawing. This keeps everyone safety conscious and ties in with the payroll pools that have developed in many plants.

A variation of this weekly drawing is to eliminate all workers in a department in which there has been an accident. Thus, all employees in the department suffer if one employee has an accident. Safety is a topic of conversation, observation and activity all the time.

Best results are obtained when the contests and the drawings follow these suggestions:

(1) Keep the time limit of the contest under thirty days and drawings on a weekly basis.

(2) Make the rewards worthwhile to build greater worker enthusiasm.

(3) Post contest results or names of the drawing winners as soon as possible.

(4) Emphasize safety in all activities connected with the contest or drawing.

These three methods of promoting safety are by no means the complete list . . . they represent ideas that other plants have found helpful. Variations of these ideas and other methods of promoting safety are all around any rubber plant. Management that has a keen desire to maintain a low accident rate will find plenty of ways to remind the workers and supervisors that *safety is everyone's problem—every day!*

A safety bulletin board which attains its objective by relating to the plant in which it is displayed and thus utilizing plant human interest to attract a response.

Rubber Division Meets in Chicago

Four Symposia and Presentation of Goodyear Lecture Highlight Meeting

► Approximately 900 members and guests attended the 74th meeting of the Division of Rubber Chemistry which was held on September 10-12 at the Hotel Sherman in Chicago, Ill. Since this meeting was held in conjunction with the 134th national meeting of the parent society, and the latter handles all registration, no exact figure on attendance for the Rubber Division meeting can be determined. The estimated figure of 900 was somewhat below expectations.

The meeting featured the presentation of 31 technical papers at four separate sessions, the election of new officers for the 1958-59 period, the presentation of the Charles Goodyear Lecture by Dr. J. C. Patrick, the 1958 Medalist, a business meeting, a luncheon-meeting of the 25-Year Club, the Suppliers' Cooperative Cocktail Party, and the Division banquet.

New officers for the 1958-59 period, determined by letter ballot and announced during the business session, include E. H. Krismann, of the Elastomer Chemicals Department of E. I. du Pont de Nemours & Co., as chairman, and W. J. Sparks, of the Esso Development and Engineering Co., as vice-chairman. R. H. Gerke (U.S. Rubber) and G. E. Popp (Phillips Chemical) were re-elected secretary and treasurer, respectively. J. H. Ingmanson (Whitney Blake) was elected delegate-at-large.

Eight new directors representing various local rubber groups were also elected. These were: *Akron,* S. C. Nicol (Goodyear); *Boston,* B. H. Capen (Tyer Rubber); *Buffalo,* E. F. Sverdrup (U. S. Rubber Reclaiming), *Canada,* O. R. Huggenberger (Dominion Rubber); *Chicago,* H. D. Shetler (Chicago Rawhide); *Fort Wayne,* M. J. O'Connor (O'Connor & Co.); *Los Angeles,* C. E. Huxley (Enjay); *New York,* W. M. Gall (Luzerne Rubber).

The technical program for the meeting was divided into four sessions, each with its own theme. On Wednesday afternoon, September 10, a series of papers were presented on "Analytical Methods, Pigments and Properties." R. F. Dunbrook (Firestone), Division chairman, presided. The following morning papers on "Vulcanization and Deterioration" were given with E. H. Krismann (DuPont), Division vice-chairman, presiding.

On Thursday afternoon, S. C. Nicol (Goodyear), presided over the session which featured papers on "High Temperature Resistance." The last session was held on Friday morning, September 12, and featured a group of technical papers devoted to "New Elastomers and Adhesives." A. E. Laurence (Phillips Chemical), presided over this session. (Abstracts of all the papers presented at the Chicago meeting appeared in the July, 1958, issue of RUBBER AGE.)

One of the highlights of the meeting was the presentation of the Charles Goodyear Lecture by Dr. J. C. Patrick, discoverer of "Thiokol" and long associated with the Thiokol Chemical Corporation. The citation awarded to Dr. Patrick stated: "For research, development and production of polysulfide rubbers which were the first synthetic rubbers produced commercially in the United States and of the liquid polymers which are used for solid rocket propellants."

In his lecture, presented at the end of the technical session held on Thursday morning September 11, Dr. Patrick reviewed the history of the polysulfide rubbers, particularly the initial steps leading to the discovery and eventual commercial production of Thiokol. He sprinkled his talk with anecdotes and predicted that the polysulfide rubbers, in all of their ramifications, have a brilliant future.

Drs. Dunbrook, Patrick and Garvey examine the Goodyear Medal.

Business Session Particularly Active

The business meeting was held toward the end of the technical session on Thursday morning, September 11, under the chairmanship of Dr. Dunbrook. The first order of business was a moment's silence in memory of members who had passed away since the last meeting. These were: G. G. Balazs, T. G. Daub, Jr., Elmo E. Hanson, J. M. Jackson, A. J. Kearfott, Edward Ray Lasser and H. A. Morton.

The next order of business was action on a series of changes in the bylaws of the Division, all of which had met with the approval of the Executive

Committee. These changes were presented in detail and all of them were approved without dissent. They included the following:

(1) The annual dues of regular members were increased from $4.00 to $6.00 per year and those for associate members from $6.50 to $8.50. (Article II).

(2) If any member fails to pay his annual dues by April 15 of each year he will be charged an extra fee of $1.00 for reinstatement. Delinquent associated members will be charged an extra fee of $1.50 for reinstatement. (Article II).

(3) Emeritus members shall no longer receive gratis copies of "Rubber Chemistry and Technology" nor free copies of the Bibliography of Rubber Literature as published. (Article II).

(4) The Secretary, Treasurer, Assistant Treasurer and Business Manager of "Rubber Chemistry and Technology" shall be bonded in amounts to be determined from time to time by the Executive Committee. (Article III).

(5) The Executive Committee shall consist of the Officers and Directors of the Division, the Councilors, the Assistant Treasurer, and the Editor of "Rubber Chemistry and Technology." (Article V).

(6) The Chairman shall appoint, with the approval of the Executive Committee, an Assistant Secretary, an Assistant Treasurer and an Assistant Business Manager of "Rubber Chemistry and Technology." Such appointments shall be effective for no longer than one year. (Article V).

(7) The Assistant Treasurer shall in addition to assisting the Treasurer serve as Business Manager of "Rubber Chemistry and Technology." The Assistant Business Manager of "Rubber Chemistry and Technology" shall serve as Advertising Manager. (Article IX).

(8) Companies and libraries may make application and on acceptance may subscribe to "Rubber Chemistry and Technology" at the rate of $9.50 per year. (Article IX).

(9) The Chairman, Vice-Chairman, immediate past Chairman, Secretary and the Editor of "Rubber Chemistry and Technology" shall serve as the Papers Reviewing Committee. (Article XII).

(10) The terminology of the by-laws pertaining to the Charles Goodyear Medal Award was revised throughout and the paragraph pertaining to the mechanics involved was completely amended. Under this revision the following now applies:

(a) The Secretary shall, prior to the meeting of the Executive Committee at which a Medalist is to be elected, solicit nominations from the members of the Division, indicating the need for documentation.

(b) At least two weeks before the date of the announced meeting of the Executive Committee the Secretary shall submit to each member of the Committee a list of nominations and the nomination documents.

(c) The last date for receipt of nominations shall be established by the Secretary and mentioned in his notice. Nominations received subsequent to this date shall automatically become nominations for the following year.

(d) All nominations shall be for one annual election only. If a nominee is not elected in one year, he must be renominated to be considered for election in a subsequent year.

Messrs. LaBrecque and Laurence of the Local Arrangements Committee pictured at the meeting.

It was announced at the business meeting that L. V. Cooper (Firestone) and R. B. Appleby (DuPont) have been appointed to the Finance and Budget Committee and that George Hackim, Jr. (General Tire) has been named Assistant Business Manager. It was further reported that W. S. Coe (Naugatuck Chemical) and J. D. D'Ianni (Goodyear) have been appointed to replace Howard I. Cramer, Councilor, and J. M. Ball, Alternate Councilor, respectively. Also that the Division had extended official sponsorship to the Southern Rubber Group.

One of the final actions at the Business session, other than the report of the Tellers Committee (reported above), was the presentation of framed certificates to G. Kraus and R. L. Collins, of the Phillips Petroleum Co., representing the Best Paper Award for the Cincinnati meeting of the Division last spring. The paper was entitled "Odd Electrons in Rubber Reinforcing Carbon Blacks." Mr. Kraus accepted the certificates.

Patrick Honored at Banquet

The highlight of the Division banquet, held on Thursday evening, September 11, in the Grand Ballroom of the Hotel Sherman, was the presentation of the Charles Goodyear Medal, as well as the scroll and the $200 honorarium which accompanies it, to Dr. Patrick. Approximately 504 members and guests were in attendance.

After an excellent dinner, featuring prime roast ribs of beef, Dr. Dunbrook took the floor and expressed the thanks of the Division to the Local Arrangements Committee. He also announced that the Executive Committee had formally approved sponsorship of the recently-organized Southern Rubber Group and had John Bolt (Naugatuck Chemical), who was active in the organization of the group, take a bow. He then introduced all of the members and guests seated on the dais, including Mr. Krismann, the newly-elected Division chairman. Mr. Krismann urged all members to make plans to attend the Spring Meeting of the Division in Los Angeles next year.

Chairman Dunbrook then introduced Joseph Crosby, president of the Thiokol Chemical Corporation, who discussed "Patrick—the Man." In his talk, Mr. Crosby revealed that Dr. Patrick started his professional life as a medical doctor. After serving in the Medical Corps in World War I, Dr. Patrick returned to Kansas City, his birthplace, and turned to chemistry. This interest took him to South America, where he spent a few years, later coming back to Kansas City where he organized the Industrial Testing Laboratories.

It was during his operation of the testing laboratories that Dr. Patrick developed the polysulfide rubber now known as "Thiokol." He tried to interest several Kansas businessmen in the new material without success until his path crossed that of the late Bevis Longstreth. The latter recognized the potential of the new material and subsequently founded the Thiokol Corporation, now known as the Thiokol Chemical Corporation. Mr. Crosby briefly

George E. Popp, treasurer of the Rubber Division and Roscoe H. Gerke, secretary, enjoy the festivities at the banquet.

related some of the trials and tribulations during the early growth of the company.

The speaker also stated that although Dr. Patrick had spent some 25 years in the field of polysulfide polymers, he also had other interests. This included the grinding of lenses and the production of telescopes. Among his hobbies is the finishing of fine furniture. Dr. Patrick is married, has two daughters, and a son currently active in the field of biochemistry.

The Medalist was then presented by Dr. B. S. Garvey (Pennsalt Chemical), former Division chairman, and the conferring of the medal, scroll and honorarium was accomplished by Dr. Dunbrook. In acknowledging the presentation, Dr. Patrick stated that he was both honored and grateful to the Rubber Division for his selection as Goodyear Medalist.

The banquet was concluded with the presentation of an excellent variety show, generally regarded as one of the best in several years. Indicative of the ingenuity of the Local Arrangements Committee where the banquet was concerned was the use and distribution of buttons reading "I've Got My Banquet Ticket Have You?"

Just prior to the Division banquet, members and guests attended the Annual Suppliers' Cooperative Cocktail Party. This affair, open to both members and guests of the Rubber Division, was held in the Exhibition Hall of the hotel and attracted the usual large attendance. It was made possible by contributions received from some one hundred suppliers.

25-Year Club Holds Luncheon

Some 130 members attended the luncheon-meeting of the 25-Year Club, held on Wednesday noon, September 10, at the Sherman. C. M. Baldwin (United Carbon), who presided, welcomed the members to Chicago and pointed out that the initial meeting of the club was held in Chicago a little more than ten years ago. The current meeting, he said, was the 21st to be held.

H. A. Winkelmann (Dryden Rubber) then took over the proceedings and urged all eligible for membership to send their names to the secretary, Earl B. Busenburg, B. F. Goodrich Industrial Products Co., Akron, Ohio. All that is required is twenty-five years of affiliation with the rubber industry. There are no dues of any kind. He also suggested that members of the club who still have not secured their membership pins write direct to Owen J. Brown, Jr., Godfrey L. Cabot, Inc., Boston, Mass. These pins are available through the courtesy of the Cabot organization.

Dr. Winkelmann then introduced some of the outstanding members present, including Arnold Smith (Monsanto, retired), who served the Rubber Division as secretary from 1919 to 1927. New members present stood and introduced themselves, including Don Fraser (Garlock Packing). A moment of silence was observed in memory of Ray Lasser (Harwick Standard Chemical) who passed away since the last meeting of the club. It was announced that the club will hold its usual luncheon-meeting at the next meeting of the Rubber Division, which will be held in Los Angeles next spring. E. G. Partridge (University of Southern California) will act as chairman.

Dr. Dunbrook (right) congratulates G. Kraus, recipient of the Best Papers Award.

The usual competition was then held to determine the oldest member present in point of service who had not previously been recognized by the 25-Year Club. Honors this time went to J. E. Warrell, vice-president and general manager of the Carlisle Tire & Rubber Co. Mr. Warrell, who has been associated with the rubber industry for a period of 62 years in one way or another, first joined the Lee Tire organization in 1910. After serving in World War I, he joined Carlisle Tire, remaining there until 1928 when he became affiliated with the former Pharis Tire & Rubber Co. He returned to Carlisle Tire in 1944 and has been active with that company since.

A list of members of the 25-Year Club was made available at the luncheon-meeting through the courtesy of the United Carbon Co. Copies can be secured by writing C. M. Baldwin, 1620 Field Building, Chicago 3, Ill.

Credit to Committees

All functions at the Chicago meeting went off smoothly and even the usual room difficulties at the hotel were not in evidence. Special thanks are due to the Local Arrangements Committee which was headed by A. E. Laurence as general chairman, and V. J. LaBrecque (Victor Manufacturing) as general vice-chairman. The chairmen in charge of various activities included the following:

Finance, S. F. Choate (Tumpeer Chemical); *Printing,* L. W. Heide (Acadia Synthetic); *Banquet,* J. P. Sheridan (N. J. Zinc), and R. R. Kann (Goodyear Chemical); *Program and Meeting,* H. D. Shetler (Chicago Rawhide); *Housing,* J. Groot (Dryden Rubber); *Registration,* Robert Varick; *Ladies Entertainment,* J. E. Stonis (C. P. Hall); *Plant Trips and Transportation,* H. E. Minnerly, Jr. (Goodrich Chemical); *Publicity,* M. J. O'Connor (O'Connor & Co.); *Information,* F. P. Steitz (Huber).

Special thanks are also due to C. W. Baldwin who chaired the luncheon-meeting of the 25-Year Club and who acted as host at the Suppliers' Cooperative Cocktail Party. Members of the committee handling this annual social function include C. A. Bartle (DuPont), general chairman, and the following: A. I. Brandt (Goodrich Chemical), O. J. Brown, Jr. (Cabot), C. W. Christensen (Monsanto Chemical), C. O. Davidson (Columbian Carbon), A. H. Eufer (Vanderbilt), W. J. Geldard (Naugatuck Chemical), M. E. Lerner (RUBBER AGE), C. O. McNeer (Goodyear Chemical), C. H. Peterson (U. S. Rubber Reclaiming), and Mr. Baldwin.

Fuller Plans Adhesives Unit

► H. B. Fuller Co., St. Paul, Minn., has announced plans to erect a new adhesives manufacturing plant in Fairfax, Kansas. The new structure will be erected on a 1¾ acre land site, and will have 14,325 square feet for production and warehouse with an additional 2,333 square feet of air conditioned office space. It will be constructed of structural steel framing with non-load-bearing exterior walls of brick and concrete block. Glass, aluminum colored panels, and brick will be used for the exterior. Completion is scheduled for early 1959. Kansas City operations were established in 1943 as the first Fuller branch plant. The company now has operating plants and warehouses in 23 cities.

New Pennsalt Plant Opens

► A new plant for the manufacture of mono-, di-, and trimethylamine, has been placed on stream by the Industrial Chemicals Division of Pennsalt Chemical Corp. at Wyandotte, Mich. With the completion of this plant, Pennsalt is able to offer compounders a complete line of the lower alkylamines from methyl through amyl. The new methylamines will broaden the application of "Sharples" brand amines in such diverse fields as rubber accelerators, spinning solvents for synthetic fibres, agricultural chemicals, pharmaceuticals, dyestuffs, feed additives, ion exchange resins, photographic chemicals, and detergents.

Northern California Group Initiates Fall Meetings

► Prime steaks barbecued in western family style were served at the Annual Summer Outing of the Northern California Rubber Group held on September 6 at the Little Hills Ranch near San Ramon, Calif. Ray Brown (Burke Tire) was chairman of the affair that included activities such as swimming, softball, volleyball and kiddie games highlighted by a gentlemen's footrace. First prize in the footrace, which was a regulation football went to Vic Carriere (Mansfield Tire).

Past presidents of the Group were honored at the first meeting of the 1958-59 season which was held on September 11 at the Berkeley Elks Club, Berkeley, Calif. The guests of honor were Ralph Hickcox (Oliver Tire), Halsey Burke (Burke Tire), Russ Kettering (Oliver Tire), Herman Jordan (DuPont), George Farwell (Goodyear), Don Good (American Rubber), Fred Swain (R. D. Abbott), Ross Morris (Mare Island Naval Shipyard), Joe Hollister (Mare Island Naval Shipyard) and Jim Stull, retired. Orlando M. Breese, staff speaker for the National Association of Manufacturers, presented a talk entitled "What Is America?"

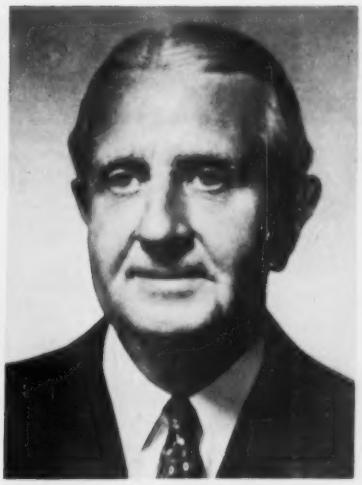
The second annual Evans Lecture series was to have begun on October 7 at the University of California at Berkeley. Six weekly lectures have been scheduled in this series on the following subjects: Statistical Control Testing; Special Elastomers, Adiprene, Fluorinated Elastomers and Silicone; Hydrocarbon Plasticizers and Softeners; Reclaimed Rubber Antioxidants and Antiozonants, and Accelerators and Vulcanizing Agents. Each session will consist of a lecture followed by a question and answer period during which the speaker will serve as moderator.

Emil H. Krismann, vice-chairman of the Division of Rubber Chemistry of the American Chemical Society, was to have spoken on the activities of the ACS and its relation to the local sponsored rubber groups, at the meeting scheduled for October 2. Mr. Krismann is manager of the Akron District of the Elastomer Chemicals Department of E. I. du Pont de Nemours & Co., Inc.

Kenney Named Manager

► Stowe-Woodward, Inc., Newton Upper Falls, Mass., has appointed Thomas F. Kenney, who has been associated with the company for 39 years, to the newly created position of manager, roll specifications, in the Research and Development Department. Mr. Kenney has served as plant superintendent for many years and has wide knowledge of rubber covered rolls. He has been associated with the American Management Association and has attended its Academy of Advance Management.

J. Ward Keener



John L. Collyer

Keener Succeeds Collyer at Goodrich

► B. F. Goodrich Co., Akron, Ohio, has announced that J. Ward Keener, president of the firm, has also been elected chief executive officer succeeding John Lyon Collyer, who has retired from that post but will continue with the company as chairman of the board. Mr. Keener, a graduate of Birmingham-Southern College, holds a master's degree from the University of Chicago and four years ago, was awarded an honorary doctor's degree by Birmingham-Southern. He taught economics and business administration at Ohio Wesleyan University for eight years before he joined Goodrich, in 1937, as a research analyst. Later, he became director of business research, assistant to the financial vice-president and assistant to the president. In 1946, he was elected vice-president of employee relations and became vice-president with corporate staff responsibilities in 1950. Mr. Keener was elected executive vice-president with operating responsibilities for several of the company's divisions in 1956 and was elected president in 1957. During his career with Goodrich, he has also served the government in various capacities.

Mr. Collyer was born in Chelsea-on-the-Hudson, N. Y., and graduated from Cornell University. Starting in the shipbuilding business with Bethlehem Shipbuilding Corp., he switched to the rubber industry in 1923, when he joined the American subsidiary of Dunlop Rubber Co. Mr. Collyer was elected president of Goodrich in September 1937, while he was managing director of Dunlop. While with Goodrich, he has also served in government posts.

H. K. Porter Seeks Tenders

► H. K. Porter Co., Inc., New York, N. Y., has requested tenders for 125,000 shares of Thermoid Co. common stock at $11.50 a share. Porter will pay the cost of applicable Federal and New York State transfer taxes. The offer was to have been handled by J. P. Morgan & Co., Inc., and shares tendered were to have been in on or before 3 p.m., August 25. Payments for shares purchased were to have been made on or before August 29. In January, Porter acquired 325,000 shares of Thermoid's approximately 850,700 shares outstanding. At Thermoid's annual meeting in May, the board of directors was reduced from 13 to 9, with five of the seats on the board going to Porter representatives. Porter spokesmen said that should Porter successfully increase its ownership in Thermoid through the tender offer, "there is no plan to change the present management arrangements in the near future."

Beebe Constructs New Unit

► Beebe Rubber Co., Nashua, N. H., has announced that ground has been broken for construction of a new 3000 square foot, one-story addition to the company's administrative building. Expected to permit consolidation of production, sales and billing offices in one unit, the new construction will also increase manufacturing space by taking the production offices out of the plant. The building will connect present offices with the main plant.

Akron University Celebrates

50th Anniversary of the Teaching of Rubber Chemistry

Gala Affair on October 3 Features

- **Honorary Degrees to Whitby and Waterman**
- **Symposium on Macromolecules and Elastic Networks**
- **Dedication of Rubber Science Hall of Fame**
- **Hospitality Hour Hosted by Akron Rubber Group**
- **Banquet Address by Waterman**

► A full schedule of events featured the celebration of the 50th Anniversary of the Teaching of Rubber Chemistry held on October 3 on the campus of the University of Akron in Akron, Ohio. Dr. Norman P. Auburn, president of Akron University, keynoted the all-day program at a morning convocation in Memorial Hall. Dr. Auburn, speaking on "Is This the Nuclear or the Unclear Age?", observed that this nuclear age should bring us many blessings and riches. Since it is also an unclear age, however, it may also bring us trials and tribulations.

Dr. Auburn stated that we can profit from the blessings and limit the tribulations to the extent that we use our God-given talents intelligently. He stated that the purpose of the University is to help prepare the students to live in the nuclear age.

Confers Degrees

Following his address, Dr. Auburn conferred honorary Doctor of Science degrees upon Dr. Alan T. Waterman, director of the National Science Foundation, and Dr. G. Stafford Whitby, consultant on rubber research and Professor Emeritus of Rubber Chemistry at Akron University.

Dr. Waterman, noted physicist, teacher, author, editor and administrator, has served as director of the National Science Foundation since 1951. As Professor of Physics at Yale University he was responsible, over a period of thirty years, for the education of scores of scientists.

Dr. Whitby has been engaged in the rubber industry since 1910 when, as a young chemist in Malaya, he first began to apply the principles of chemistry to the infant rubber industry. He served as a Professor of Chemistry at McGill University from 1919 to 1929 and as Director of the Chemistry Laboratories of the National Research Council of Canada from 1929 to 1939. During World War II, he served as a consultant to both the Canadian and United States Governments on rubber problems.

Students of the University as well as faculty members and some 600 rubber scientists, researchers and educators participated in the impressive morning ceremonies.

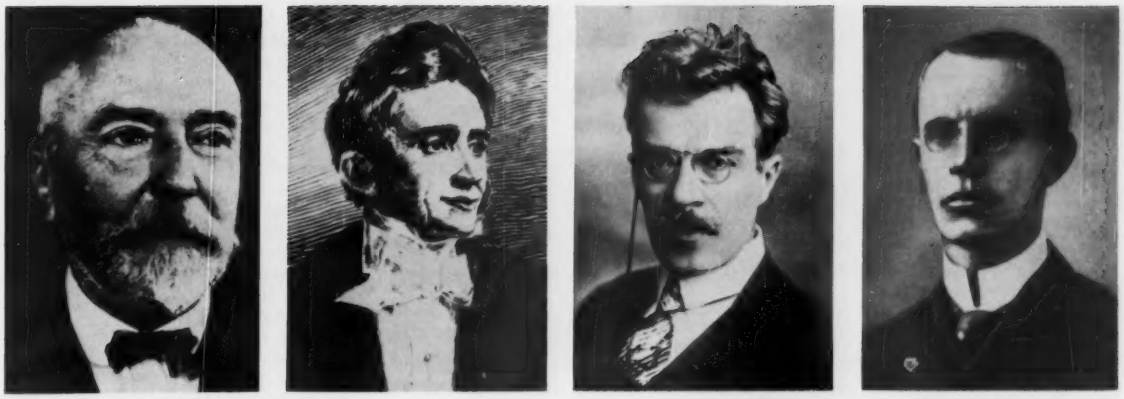
After an informal luncheon, Dr. Maurice Morton, director of the Institute of Rubber Research at the University, led an afternoon symposium on "Macromolecules and Elastic Networks." Participating in the symposium were Dr. Whitby, Dr. Peter Debye, 1936 Nobel Award Winner and Professor Emeritus of Chemistry at Cornell University, and Dr. Paul J. Flory, executive director of research at the Mellon Institute.

Dr. G. Stafford Whitby

Dr. Whitby chose for his subject, "A 50-Year Retrospect of Rubber Science." The speaker stated that it is interesting first to glance back a full century in the history of rubber science, and note there the significant figure of Greville Williams. In 1860 Williams discovered, in isoprene, the key to the chemical structure of rubber and to its synthesis. Yet nearly fifty years passed before serious attempts were made to unlock the secret of the structure of the rubber molecule and to develop practical means of synthesizing rubber. The time was not ripe for the flowering of rubber chemistry, and Williams himself turned his attention to the new field of coal tar chemistry.

The two most important concepts developed in rubber science during the last fifty years—concepts fundamental to our present understanding of the behavior of rubber—are (1) the macromolecularity of rubber, which involves the idea that, contrary to what early workers thought, rubber does not consist of simple molecules on which colloidal characteristics are "superimposed", but that the colloidal properties or rubber are inherent in its macromolecularity, and (2) the formation in vulcanization of a chemically-bonded network between the macromolecules as an explanation of the elasticity of vulcanized rubber, Dr. Whitby stated.

The two most important discoveries that have contributed to improvement



Shown here in the usual order are the first members of the Rubber Science Hall of Fame: Henri Bouasse, Charles Goodyear, Ivan I. Ostromislensky and Carl O. Weber. A photograph of the fifth member, C. Greville Williams, is not available.

in the quality of rubber goods during the last fifty years have been (1) the development of organic accelerators, and (2) the use of carbon black for reinforcement, both of which are reviewed historically. Among other subjects on which notable progress has been made and concerning which comments are offered are (1) the composition and behavior of Hevea latex, and (2) the development of improved synthetic rubbers.

There are many good reasons for viewing any branch of science in its historical perspective. One of them is to induce in us a becoming modesty about the achievements of our own generation and a sense of our just indebtedness to our predecessors. Gratified though we may well feel about the present state of development of rubber science, and inadequate and even crude though we may think the ideas of our predecessors fifty years ago, we should not be unmindful of the chastening thought that many of today's ideas in rubber science will indubitably seem in turn inadequate and crude fifty years hence, Dr. Whitby concluded.

For his part in the symposium, Dr. Debye spoke on "Measurements of Macromolecules," covering such topics as viscosity as a measure of coil dimensions and the inadequacy of Staudinger's rule and the statistics of the restricted random flight. Other subjects covered by the speaker covered coil swelling and drainage; light scattering and osmotic pressure; angular dissymmetry of scattered intensity as a measure of coil size, and the radius of gyration.

The final speaker at the symposium, Dr. Flory, chose as his subject, "Rubber Elasticity." Dr. Flory declared that scientific investigations on the constitution of rubber, and especially on the remarkable property of high elasticity, form one of the most fascinating accounts in the annals of science. The record covers a period of a century and a half; it is intimately associated with the rise of structural organic chemistry and of kinetic and thermodynamic interpretations of the properties of matter. Scientific interest in rubber and rubberlike materials culminated in modern times in the formulation of the statistical-kinetic theory of high elasticity—an outstanding achievement of polymer science.

Discusses Elasticity

The elasticity of rubber was recognized long ago to bear close phenomenological resemblance to the elasticity of gases. The correspondence is retained in modern interpretations and is strikingly illustrated by comparison of the rubber elasticity equation of state with the equation of state for gases. Manifestation of high elasticity is not confined to selected polymeric substances, but is in fact observed, under suitable conditions, in a wide variety of polymers including proteins.

More recently, attention has been focused on the deviations of rubber elasticity from ideality. These deviations are related to specific features of the polymer chain structure. The dynamic behavior of rubberlike materials has long been a favored subject for experimental investigation. Molecular interpretation in this area is vastly more difficult, and only very recently have partial theoretical advances been indicated, Dr. Flory said.

Although the subject matter of the symposium was highly technical, over 550 invited guests were in the audience.

Establishment of the "Rubber Science Hall of Fame" followed the symposium with the naming of the first members, chosen by a committee of scientists from the Division of Rubber Chemistry, American Chemical Society. Dr. Thomas Sumner, head of the Chemistry Department at Akron University, presided over this portion of the program. Those elected to the Hall of Fame are:

Charles Goodyear (1800-1860) — American inventor, who made possible the commercial utilization of rubber by his discovery of sulfur vulcanization in 1839, and who developed many new applications for rubber in commerce and industry.

C. Greville Williams (1829-1910)— English chemist who, in 1860, carried out a precise analysis of rubber and its decomposition products, during the course of which he discovered and named a new compound "Isoprene" and

Dr. Peter Debye

Dr. Paul J. Flory

Dr. Norman P. Auburn (left) University president, receiving the RMA commendation from RMA President Ross T. Ormsby.

recognized it as the basic unit of rubber and gutta-percha.

Carl O. Weber (1860-1905)—German-born chemist, who was the first to carry out a scientific study of vulcanization and of the chemistry of rubber in general, and whose book "The Chemistry of India Rubber", in 1902, was a landmark in the scientific progress in this field.

Henri Bouasse (1866-1953)—French physicist, noted for his outstanding theoretical and experimental studies of the physics of rubber elasticity, and whose work, in 1903-04, laid the basis for modern rubber physics.

Ivan I. Ostromislensky (1880-1939)—Russian-born chemist, noted for his pioneering work in polymerization and synthetic rubber, for his synthesis of butadiene from alcohol, and for his discovery of non-sulfur vulcanizing agents.

Portraits of the Hall of Fame members will hang in the Chemistry Library, newly located in Knight Chemical Laboratory, the home of chemistry activities at the University of Akron.

Hospitality Hour

Following this portion of the program there was a "hospitality hour" at the University Club. The Akron Rubber Group graciously acted as host for this affair which was marked by the serving of hors d'oeuvres and liquid refreshments. The hospitality hour was exceptionally well-handled as were all other of the day's events.

At the conclusion of the hospitality hour, some 450 persons adjourned to the University's new Student Center, site of the evening banquet which featured Dr. Waterman as principal speaker. Harry P. Schrank, executive vice-president of the Seiberling Rubber Co. and vice-chairman of the Akron University board of directors, served as banquet toastmaster. Another highlight of the banquet was the presentation of a resolution on behalf of the board of directors of the Rubber Manufacturers Association, Inc.

Presented by President Ross R. Ormsby, the resolution commended the University of Akron "for embracing the science of rubber chemistry as a part of its curriculum in 1908 and for its wisdom in nurturing and expanding this department to the point where it has won international recognition in its special field of technology."

Other speakers at the banquet included Dr. Auburn and Dr. Sumner, who briefly reviewed fifty years of instruction in rubber chemistry at the University. Dr. Sumner noted that the University is attempting to provide all its students with a proper grounding in the sciences to better enable them to cope with current world problems.

Rubber Research Institute

Dr. Morton also spoke at the banquet, describing work now being carried on by the Institute of Rubber Research. He observed that a majority of the graduate students pursuing studies at the Institute are married and many have children. These students, he stated, need have some means of support so that they can continue their studies. Many of the students are employed in local industry and undertake their graduate studies in the evening.

Dr. E. H. Cherrington, Jr., Dean of Buchtel College of Liberal Arts of the University of Akron, introduced the principal speaker, Dr. Waterman, who spoke on "Basic Research and Industrial Progress." In his interesting talk, Dr. Waterman outlined some of the basic activities of the National Science Foundation, particularly where these activities have bearing upon rubber. In a portion of his talk, the speaker examined the world of fifty years ago and noted that the passing of the years have seen the veritable transformation of our society, and this transformation has come about through a technological revolution.

Today, he observed, the university has become the symbol for the type of scholarly research that concerns itself not with immediate applications but with advancing the frontiers of knowledge further and further into the unknown. The whole history of science shows that progress in science as well as progress in technology are in jeopardy unless every attempt is made to continue free research and the freedom of investigators on research.

Cites Government Activities

Dr. Waterman cited some government activities and programs which contribute to the financial support of free research, and stated that we should all encourage and support basic research to the limits of the capabilities of our scientists and engineers. By so doing, he declared, we make available to ourselves the full potentialities of all new discoveries of science.

Six of the Akron community's major rubber industrial leaders served as an Honorary Committee for the half-century observance. As committee members, they worked with Mr. Schrank, who served as Organizational Chairman for the event.

Chairman of this Honorary Committee was Paul W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co. Serving with Mr. Litch-

Dr. Morton, Mr. Schrank, Dr. Waterman and Dr. Sumner check the order of events at the Akron University celebration.

field were R. E. Bloch, chairman of the board of the Mohawk Rubber Co.; John L. Collyer, chairman of the board of the B. F. Goodrich Co.; Harvey S. Firestone, Jr., chairman of the board of the Firestone Tire & Rubber Co.; William O'Neil, president of the General Tire & Rubber Co., and J. P. Seiberling, president of the Seiberling Rubber Co.

Serving with Mr. Schrank on the Organizational Committee were Dr. Auburn; George W. Ball, director of University Relations; Dr. Morton, Dr. Cherrington and Dr. Sumner. Representing industry on the committee were Lawrence M. Baker, factory manager of General Tire; Dr. Otis Cole, assistant director of the Chemical Laboratories at Firestone; Dr. James D'Ianni, assistant to the vice-president in charge of research at Goodyear, and Dr. Waldo Semon, director of polymer research at the B. F. Goodrich Research Center.

A third major committee that helped to coordinate the all-day program was the Akron University board of directors, composed of chairman, Hurl J. Albrecht; L. S. Buckmaster, international president of the United Rubber Workers; Charles J. Jahant, vice-president of General Tire; Attorney Lee Ferbstein; Mrs. Walter A. Hoyt; J. Ward Keener, president of Goodrich; E. J. Thomas, president of Goodyear, and Joseph Thomas, vice-president, secretary and general counsel of Firestone.

Chairman Schrank also appointed four University faculty sub-committees to work on details of the anniversary observance.

Dewey & Almy Appointments

► Dewey & Almy Chemical Co., Cambridge, Mass., has appointed James F. Murphy, Jr., as project manager for the firm's new $4,000,000 Owensboro, Ky., plant. The company has also announced that Craig Falk will be in charge of the organic chemicals area of the new plant, while Richard R. Shallberg will be in charge of the battery separator area. Mr. Murphy, who has been with Dewey & Almy since 1946, is a 1944 mechanical engineering graduate of Cornell University. He will be responsible for plant engineering, construction, staffing and start up. Mr. Falk is presently assistant plant manager at the company's Acton, Mass., organic chemicals plant and Mr. Shallberg holds a similar position at the Acton battery separator plant. Expected to be completed early in 1959,, the Owensboro plant will double the company's production capacity for vinyl acetate polymers and copolymers and styrene-butadiene copolymer latices and will increase other facilities as well.

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Dr. Waterman is shown addressing the banquet held in the new Student Center at Akron University.

Dayton Increases Capital

► Dayton Rubber Co., Dayton, Ohio, has borrowed $11,400,000 from the Equitable Life Assurance Society of the United States through the issuance of 4⅝ per cent long-term notes, due serially from December 1, 1959, to December 1, 1971. Proceeds will be used to retire existing long-term notes and to equip a new mechanical rubber goods plant to be constructed in Springfield, Mo. The balance will be added to working capital. The new plant will be built on a 62-acre site on which the company now holds an option. It will have approximately 175,000 square feet of manufacturing space, with a one-story brick and concrete main building of 700 x 240 feet. The company expects the Springfield plant to permit the manufacture of mechanical rubber goods on a more efficient basis and to expand its production. Dayton states that production of mechanical rubber goods at the Springfield plant will enable the company to increase tire manufacturing capacity in Dayton.

King Named Vice-President

► W. Adrian King, formerly general sales manager of the Chemicals Division, Olin Mathieson Chemical Corp., New York, N. Y., has been named vice-president of the division. Mr. King joined Mathieson in 1953 as director of sales of the Hydrocarbon Division and subsequently was appointed manager of the Automotive Products Department of the division. A veteran of more than 30 years in the chemical industry, Mr. King was previously employed by the American Cyanamid Co. and Allied Chemical Corp. He is a native of Tupelo, Miss., and holds a B.A. degree in chemistry from Mississippi College. He also studied three years at the University of Texas Graduate School of Chemistry. Mr. King will remain in the Baltimore offices of the corporation.

Arkansas Directory Issued

► The Arkansas Industrial Development Commission, Little Rock, Ark., has issued an industrial development reference work on Arkansas, entitled "The Arkansas Encyclopedia." The four volume, 500 page work was edited and designed by William R. Ewald, Jr., AIDC chief of development, assisted by the AIDC staff. The Encyclopedia includes an 87 page "Economic Atlas of Arkansas"; a 22 page "Directory of Arkansas Industries," and a 100 page "Photographic Essay of Arkansas." The fourth volume, "An Economic History of Arkansas," in 60 pages, will be published this fall. The encyclopedia will be placed in the Library of Congress. The volumes were designed to serve as reference tools, especially for executives concerned with plant location; sales executives and others concerned with the economic potential of Arkansas. Local chambers of commerce, local industrial development corporations, utilities and railroads working with industry will also have basic reference material on the state. The volumes are available through the Arkansas Industrial Development Commission, State Capitol, Little Rock, Ark., at $25.00 for the set. Individual volumes may also be obtained.

Named Oakite Vice-President

► Oakite Products, Inc., New York, N. Y., has announced that George M. Seib, formerly secretary of the company, has been appointed vice-president, while Erwin H. Steif, previously Mr. Seib's assistant, has been promoted to secretary. With Oakite since 1922, Mr. Seib has been a member of the board of directors since 1946 and has served as secretary since 1953. Mr. Steif, a graduate of Yale Law School, joined Oakite in 1948 as legal counsel and has served on the board of directors since 1953.

General Tire Announces Three Executive Appointments

J. A. Kleinhans

George Hackim, Jr.

L. W. Reeves

► General Tire and Rubber Co., Akron, Ohio, has announced the appointment of John A. Kleinhans as manager of manufacturing; George Hackim, Jr., as general sales manager, and L. W. Reeves as commercial manager. Mr. Kleinhans will direct activities of the Chemical Division's three production facilities at Mogadore and Ashtabula, Ohio, and Odessa, Texas. He joined General Tire in 1953 as factory manager at the Mogadore plant. Mr. Kleinhans is a native of Easton, Penna., and studied chemical engineering at the Massachusetts Institute of Technology and at Lehigh University. Before he joined General Tire, he was associated with the J. T. Baker Chemical Co. He is a member of the American Chemical Society.

Mr. Hackim will direct the work of product sales managers, sales development and technical services. Formerly manager of vinyl resin sales and sales development, he joined General Tire's training program in 1948. After serving in research, he was assigned to the Chemical Division in 1950. He graduated from Akron University in 1947 with a B.S. in chemistry and during World War II, he served in the U. S. Army. Mr. Hackim is chairman of the Akron Rubber Group, and is also a member of the American Chemical Society, the Rubber Division of the A. C. S., the Chemists' Club of New York, the Society of the Plastics Industry, the Society of Plastics Engineers, the National Paint, Varnish and Lacquer Association and the Touchdown Club of Akron.

Mr. Reeves, with General Tire's Chemical Division since 1951, was formerly manager of Rubber Chemical Sales. A graduate of Cornell University, with a degree in electrical engineering, Mr. Reeves is a member of the American Chemical Society, the Akron Rubber Group and the Chemists' Club.

Firestone Revises Tire Names

► Firestone Tire & Rubber Co., Akron, Ohio, will stop using the names deluxe, super and super deluxe on its lower lines of tires, according to Joseph Thomas, Firestone vice-president and general counsel, who appeared at a Federal Trade Commission hearing. Mr. Thomas said the company would spend $280,000 to change tire molds and would edit identifications from advertising matter. J. Earl Cox, FTC examiner, who conducted the hearing, said he would keep the case open, but suspended hearings until December pending developments. Firestone had been accused of promoting second and third-line tires in a manner suggesting they were first-line tires. Firestone has denied the charges saying that the company was following practices used by every company in the industry. Mr. Cox said that while Firestone was making the changes, other companies would be doing the same thing.

Vult-Accel E Dispersion

► A ready to use accelerator dispersion is the first of a series of new products that is being released by General Latex & Chemical Corp., 666 Main Street, Cambridge 39, Mass. Named "Vult-Accel E," it was produced by a new method and tested extensively in General Latex compounds with exceptional results. Vult-Accel E is a 50 per cent active slurry of zinc diethyl dithiocarbamate. Said to be highly useful in all latex compounding, particularly in the manufacture of latex foam, Vult-Accel E is now available from any of six General Latex plants. The plant locations are in Cambridge; Dalton, Ga.; Ashland, Ohio; Charlotte, N.C.; Verdun, Que., and Brampton, Ont., Canada.

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Expands Air Wall Applications

► A new system of freight car packing, utilizing "air walls" that move on tracks and automatically keep inflated to a pre-set level, promises to cut down transit damage in box cars according to U. S. Rubber Co., New York, N. Y. Called the "pressure bulkhead method," the system affords easy conversion of any box car to one with compartments. Its chief features are the air walls—a variation of U. S. Rubber's "Shor-Kwik" inflatable dunnage bags—steel mesh bulkheads, and a low pressure air line running through the length of the car. When the air walls are inflated, voids that accumulate in transit are taken up by expansion. Company officials estimate that about 20 per cent of the nation's one million box cars carry cartons, boxes and containers that could benefit from the pressure bulkhead system. The installation costs of the system would be approximately $3,000 per car, the company reported.

Fort Wayne Hears Vodra Talk On Colored Rubber Compounds

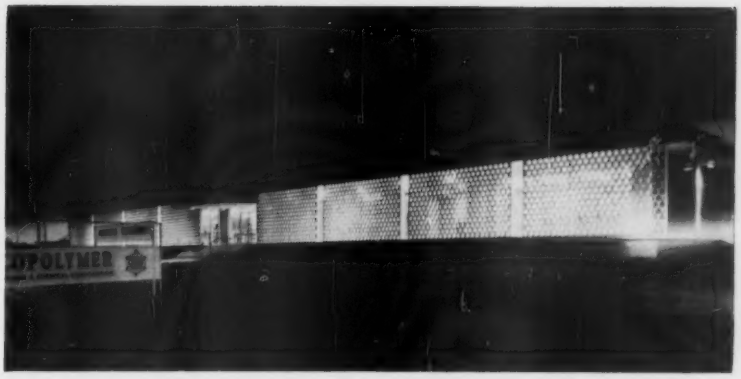
► The first dinner-meeting of the 1958-59 season of the Fort Wayne Rubber Group held on September 25 at the Van Orman Hotel, Fort Wayne, Ind., was attended by 149 members and guests and featured an address by Victor H. Vodra. Mr. Vodra, technical director for Rubbermaid, Inc., Wooster, Ohio, gave an interesting and illustrated talk on "Designing Colored Rubber Compounds." He attempted to fill the gap existing among the many articles dealing with the application of colors in rubber that neglect to give a step by step guide to building colored rubber compounds. Mr. Vodra began by saying that in order to make the cleanest, brightest compounds, it is best to start with the cleanest, lightest elastomers possible.

He said that the most common white pigments used in rubber are titanium dioxide, titanium-calcium (sulfate) pigment, zinc, oxide and lithopone. For clean, crisp colors, the compounder must start with clean, crisp ingredients and must keep them clean. Mr. Vodra pointed out that through the use of whiter fillers, less titanium dioxide is required and consequently less color is required. Somewhere between 20 and 30 parts of titanium dioxide of the 100 parts of elastomer will usually maintain satisfactory color during curing. For sunlight fastness, tripling the titanium dioxide and color may be necessary to reduce color changes to make passable stocks. Where only very small amounts of titanium dioxide would be required, zinc oxide reduces the batch-to-batch variation without masterbatching.

Maintaining Exact Color

In order to maintain an exact color match throughout the entire line, Mr. Vodra said that Rubbermaid uses a low brightness clay for low loadings, an intermediate brightness for intermediate loadings and high brightness for high loadings. Saturated materials are selected to reduce color changes during vulcanization and aging. Certain colors, such as some phthalocyanine blues will crystallize out of aromatic and naphthenic solvents and plasticizers. He suggested avoiding using them together. Selection should be limited to those which are not photosensitive or which are dark and bloom to the surface.

For the truest colors, the sulfur content can be kept as low as possible while still obtaining the properties desired. Critical colors should be kept from excessive heat and an increase in color concentration can be made, if necessary. When quality is paramount, premium priced colors in large quantities should be considered even if their cost is prohibitive. If the color migrates, a test should be made using more color. Chrome plating reduces mold staining and provides a better surface to the finished part. The color of the finished product should be checked for soap bleeding and detergent and grease resistance. Mr. Vodra summarized that it is impossible to remove dirtiness which is put into a compound through off color ingredients. He concluded that the sulfur content should be kept low and that a careful selection is necessary in choosing coloring agents and their quantities.



Copolymer Dedicates Research Center

► Copolymer Rubber and Chemical Corp., Baton Rouge, La., has dedicated its recently completed Research Building, which will be the firm's center for basic research activities. In the past, a company spokesman said, Copolymer has emphasized development activities. Construction of the new building was necessary to achieve the same high standards for research. The 180 by 60 foot structure is of modern architecture. Across the front is a unique sun screen, the design of which consists of the Copolymer trademark repeated in a series. The new center contains chemical, polymerization and instrument laboratories; coffee shop, work shop and storeroom facilities; a library and conference room for general use by all plant personnel, and appropriate office space for supervisory personnel. The building is completely air-conditioned with separate controls for each laboratory. The present research staff numbers fifteen, however, the building is designed to house a staff of thirty.

Copolymer Names Wirth

► Kenneth H. Wirth has joined the technical staff of the Copolymer Rubber & Chemical Corp., Baton Rouge, La., as development laboratory supervisor. A native of Elwood, Iowa, Mr. Wirth is a graduate of Iowa State College with a B.S. in chemistry. He was employed by Haliburton Oil Well Cementing Co. and St. Clair Rubber Co. before coming to Copolymer. Mr. Wirth is a member of the American Chemical Society, the Detroit Rubber and Plastics Group, and the Blue Water Industrial Management Club.

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Enjay Enters Plastics Field

► Enjay Co., Inc., New York, N. Y., has announced its entry into the plastics field and the conclusion of a four-year sales agreement with Spencer Chemical Co., Kansas City, Mo. Enjay will market polypropylene through its own sales organization and, under the agreement, will supply Spencer with polypropylene for resale throughout the United States. Polypropylene is said to combine the properties of lightness, high strength, high rigidity, resilience and hardness. In addition, it is resistant to heat and to many chemicals and solvents. Enjay will be supplied with polypropylene from a plant to be constructed and operated by the Humble Oil and Refining Co., which will have an initial output of 40 million pounds a year. Commercial quantities of polypropylene are expected to be available early in 1960, while market-development quantities of the product will soon be available from a ton-a-day plant.

P. L. Blanchard Named Sales Agent

► Metal Hydrides, Inc., Beverly, Mass., has announced the appointment of P. L. Blanchard and Co., Newton, Mass., as New England sales agent for foaming products. The primary products to be handled by Blanchard will be borohydride compositions as used by New England rubber, plastics and paint manufacturers.

URW Holds Convention in Miami Beach

► The United Rubber, Cork, Linoleum and Plastic Workers of America, AFL-CIO, at its 21st convention held recently in Miami Beach, Florida, re-elected Leland S. Buckmaster to his twelfth term as president, and acted upon several important issues. Delegates in attendance at the convention defeated an amendment to the constitution that would have provided for automatic payments to striking locals equal to $5.00 for each member.

Under the proposal, mandatory relief payments would have been made by the parent body to striking locals beginning the third week of a strike and continuing until a week after settlement. A local with 20 members would have received $100 starting with the third week of a strike. This would have been distributed on the basis of need with the local and the International Union having equal say about how the money would be spent.

At present, there is no hard and fast rule on the apportionment of strike relief and the International has considerable discretion as to how strike funds are allocated.

The convention also defeated a proposal that would have required that the International defend all local unions involved in civil suits arising from arbitration cases.

A resolution was passed calling for "International officers and staff departments to guide the Economic Policy Committee and negotiating teams on their deliberations dealing with the six-hour day." The URW constitution advocates the six-hour day as an industry wide goal, however, the matter is left up to local union determination. The resolution urged "union bargaining committees and company wide negotiating committees to intensify their effort to negotiate a 30-hour week with no take-home pay loss."

Dues of all 180,000 members of the union were frozen for the next two years in a roll call vote which defeated a compromise measure that would have placed the question of dues at the discretion of locals. The action means that URW dues, which range from $2.75 to $4.50 a month in the more than 400 locals, cannot be changed before the 1960 International Convention.

Finally, delegates passed a resolution that in choosing convention quarters in the future, the group would give preference to sites located in states that did not have anti-union shop laws. Official notice was served in Florida on the Mayor, Convention Bureau and several hotel managers, that the group will not convene in Florida until that state has repealed its "Right-to-Work-Law."

The resolution also provides that when contracting for future sites, the URW reserve the right to cancel its arrangements without financial obligation if a "Right-to-Work-Law" is enacted between the time the contract is signed and the date of the convention. The AFL-CIO and its affiliated organizations were called upon to adopt similar resolutions.

Resolutions

Passed:

- Future conventions will be held in states which do not have anti-union laws.
- URW will guide its Economic Policy Committee in negotiations for a six hour day.

Defeated:

- Payment of $5 per member to striking locals.
- A motion calling for URW to defend locals involved in civil suits.
- A motion permitting locals to determine dues paid by members.

Thermoid To Redeem Stock

► Thermoid Co., Trenton, N. J., has announced that on November 1, it will redeem in cash all outstanding shares of its convertible preferred stock at the call price of $55 per share. Warren E. Hill, president, said the regular quarterly dividend of 62½c a share will be paid on November 1 to holders of record on October 10. The redemption agent is the Guaranty Trust Co. of New York. Shareholders who elect to convert the preferred will be entitled to 3.4867 shares of common stock for each share of preferred. The conversion right expires at the close of business on the fifth day preceding the redemption date. The company will also pay a 10c per share dividend on the common on September 30 to shareholders of record on September 10.

Announces Name Change

► C. B. Hunt & Son, Inc., Salem, Ohio, has changed its name to Hunt Valve Co. in order to obtain closer identity with its products. Company officials have reported that several new control valves, now undergoing final tests, are expected to be introduced within the next few months.

Offers Rubber Technology Course

► Temple University Management Institute, Philadelphia, Penna., has announced that a course on Rubber Technology will be conducted at the University on twelve consecutive Tuesday evenings from 7:30 to 9:30 p.m., beginning September 23 and ending December 9, 1958. The course will be geared to men in the rubber, plastic, or chemical fields who wish to be brought up to date with the latest advances in technology.

The course will cover: Terminology; History: Natural Rubber, Gutta Percha and Balata: Diene Elastomers including Neoprene: Other Elastomers—Butyl, Polyurethane, Hypalon, Thiokol, Silicone, Rubber-like Plastics: Latex: Reclaimed Rubber: Processing; Processing Equipment: Vulcanization and Vulcanizing Agents: Degradation and Protection; Antiozidants: Reinforcement and Reinforcing Agents; Softeners; Plasticizers; and Peptizing Agents: Extenders and other compounding Ingredients. Properties of Cured Rubber—Physical Testing. Instructor, Mr. A. L. Back (A. L. Back and Associates Consulting Engineers and Chemists).

For registration write Temple University Management Institute, Cheltenham Avenue and Sedgwick Street, Philadelphia 50, Penna.

Cuban Tire Unit on Stream

► U. S. Rubber Co., New York, N. Y., has placed a new tire plant on stream at Loma de Tierra, Cuba, which was constructed to keep pace with the rapidly rising demand for tires in Cuba. Said to be Cuba's largest tire plant, the unit was erected at a cost of approximately $5,000,000 and has an annual production capacity of 125,000 passenger car and truck tires. The new plant is located on a 15-acre site just 14 miles east of Havana, which is also partially occupied by a U. S. Rubber footwear plant. The new facility has a one-story main building with 54,000 square feet of floor space and a two-story building with 25,000 square feet of floor area. The latest tire-making equipment available has been utilized.

New Monsanto Plant On Stream

► Plastics Division of the Monsanto Chemical Co. has begun production of rubber-modified styrenes at new facilities at its Springfield, Mass., plant. A new process, which is said to double the firm's capacity for medium and high impact formulations, is used at the new units.

46th N.S.C. Exposition Planned For Chicago

► The 46th National Safety Congress and Exposition of the National Safety Council has been scheduled to be held in Chicago, Ill., from October 20 through 24, along with the Annual Meeting of Safety Council Managers which will be held on October 17 and 18. Most of the events scheduled for the Congress will be held at the Conrad Hilton Hotel, although the Sheraton-Blackstone, Hamilton, Pick-Congress, La Salle and Morrison Hotels also have been designated as convention hotels. The Convention Banquet, which will be held on Wednesday evening, October 22, promises to be the social highlight of the meeting. The speaker for the banquet has not been announced, but NSC officials request that reservations be made early to assure convention-goers of accommodations at this event.

The Rubber Section of NSC has been scheduled to meet on Monday afternoon, October 20, at the Conrad Hilton. C. E. Beck (St. Clair Rubber), General Chairman, will make the opening remarks and conduct the Report on Sectional Activities. Election of 1958-59 officers will be followed by a Report of the Statistics Committee by Roland Kastell (U. S. Rubber).

Safety Symposium

A symposium on "Rubber Industry Safety" is scheduled to get underway at 2:30 P.M. with "Engineering Safety Into Manual and Automatic Curing Equipment," by E. E. Soderquist (McNeil Machine), as the first paper. The second discussion, "Safe Operation of Banbury Mixers," will be delivered by A. S. MacLeod (U. S. Rubber). "New Developments In Safety of Calenders and Tire Test Equipment," by Everett Perlberg (Adamson United) will be the final paper to be presented at the symposium and will be followed by a general discussion.

Luncheon Session

On Tuesday, October 21, activities for the Rubber Section will get underway with a luncheon that will feature Thomas H. Boyd (Manhattan Rubber) as toastmaster. Papers scheduled to be presented that afternoon are: "The Problem Drinker and the Safety Program," by J. E. Laughlin (Firestone); "A Coordinated Safety Program From Top to Bottom," by Jean Sonnhalter (Firestone); "A Pleasant Way With Incentives," by H. S. Fryberger (B. F. Goodrich); "Crusade for Safety," F. A. Burgner (Firestone), and "In-Plant and Mutual Aid Planning for Disaster," by K. K. Ketchel (United Rubber & Chemical). A general discussion will follow presentation of the papers and the session will be presided by M. R. Batche (Firestone).

Browning

Doherty

Simonds

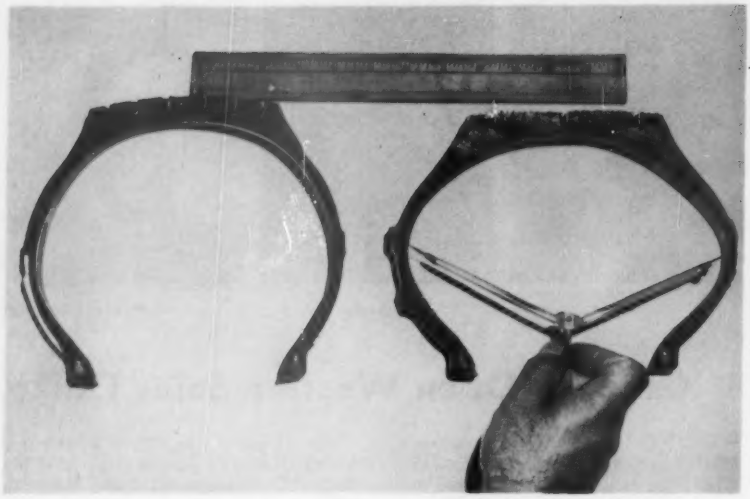
Cabot to Open Western Sales Office

► Godfrey L. Cabot, Inc., Boston, Mass., has announced that a new Cabot sales office will be opened in Los Angeles, Calif., on January 1, 1959, with Donald Simonds, previously midwestern sales manager, as Western regional sales manager. Daniel B. Doherty, Eastern regional sales manager, will succeed Mr. Simonds as midwestern regional sales manager, and Francis H. H. Browning, assistant Eastern regional sales manager, will succeed Mr. Doherty. Mr. Simonds was graduated from Tufts University with a B.S. degree in chemistry in 1937 and joined Cabot in December 1939 after completing research at Harvard University. In 1946, he was appointed assistant general sales manager and in 1951, he was named Akron office manager. He became Midwestern regional sales manager with headquarters in Akron in 1955.

Mr. Doherty, who will be transferred to Akron, joined the company in 1936, following graduation from Harvard University with an A.B. degree in chemistry. He served as a member of the technical sales staff at the Akron, Ohio, sales offices and in 1954 was transferred to New York as Eastern regional sales manager. Mr. Browning, a native of Virginia, attended Virginia Military Institute and the University of Richmond Law School. He was associated with E. I. du Pont de Nemours & Co., Inc., from 1938 to 1947 and during the war years, he also served as Captain in the Chemical Warfare Service, U. S. Army. His previous positions with Cabot include that of resident manager of the Chicago sales office and more recently, assistant to the Eastern regional sales manager in the New York office.

Mooradian Retires On 45th Anniversary

► Harry S. Mooradian has resigned as vice-president in charge of manufacturing after 45 years of service with the Dayton Rubber Co., Dayton, Ohio. Company officials said that Mr. Mooradian will continue his association with the firm on a consulting basis. Mr. Mooradian, who joined the firm in 1913, was named vice-president in charge of production in 1943 and was put in charge of all manufacturing operations in 1957. In the realignment of duties following Mr. Mooradian's resignation, O. H. Stork and Charles Wyman have been named plant manager and production manager, respectively. Mr. Stork began his career with the company in 1924 and was named plant superintendent in 1946; Mr. Wyman, who joined the firm in 1946, formerly was in charge of tire engineering.



Wider cross section of new Low Profile U. S. Royal Master passenger tire (right) is seen in this comparison with cross section of conventional tire (left). The new Royal Master is only 86 per cent as high in cross section as it is wide.

U.S. Rubber Introduces Low Profile Tire

► A new tire which contains a number of improvements in tire construction and which, according to the company, will give 60 per cent more mileage than first line tires now on the market, has been introduced by the U. S. Rubber Co. Called the Low Profile U. S. Royal Master, it is reported to be smoother riding, cooler running, more stable on curves, and more resistant to punctures and blow-outs than any other passenger tire currently available. Its new tread design is said to resist skids in every direction.

The new tire, according to G. R. Cuthbertson, vice-president and general manager of U. S. Rubber's tire division, was made possible by four engineering achievements: (1) The development of a deep, intricate mold design; (2) The development of the pressure tempering process; (3) The development of a new "homogenized" synthetic rubber compound; (4) The recent wide-scale conversion to Bag-O-Matic tire curing equipment.

The mold utilized, made of aluminum by Morris Bean & Co. of Yellow Springs, Ohio, is most unusual. It provides a tread which is a complete departure from conventional tread design. Instead of a series of ribs separated by grooves, the tread is made up of thousands of cylindrically shaped elements. These elements, referred to as "traction toes," present biting edges in all directions. They support each other and yet are free to flex individually like the bristles of a brush and easily conform to road irregularities.

The tread of the new tire has a center groove providing flexibility. Three flexible ribs are at the shoulder of the tire to maintain uniform wear and prevent squealing and scuffing on turns. According to company, tests on wet, smooth concrete showed 30 per cent better skid resistance over present first line tires, 57 per cent better breakaway traction, and 32 per cent better sideway skid resistance. On snow, tests indicated 20 per cent better skid resistance and 26 per cent better breakaway traction.

The pressure tempering process referred to is the method developed and announced by U. S. Rubber a few months ago. It is a method which strengthens the tire by taking the stretch out of nylon cord and removing the strains from tread and carcass rubber compounds. The "homogenized" synthetic rubber compound used in the new tire is based on the Synpol black masterbatches recently developed by the Texas-U.S. Chemical Co. in which ISAF is used as the reinforcing black. These masterbatches are mixed by mechanical means and are said to achieve better black dispersion and a stronger carbon-polymer bond.

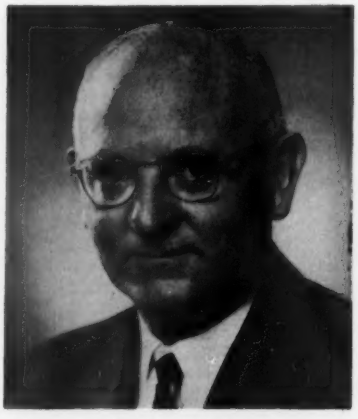
Like other low profile tires, the new U. S. Royal Master is oval in cross-section—wider than it is high. Since it is only 86 per cent as high as it is wide in cross-section, it offers the automotive engineer a means of lowering car height without reducing the wheel or brake diameter, an important safety factor. On a 15-inch wheel, for example, it lowers the height and center of gravity of a car as much as a conventional tire on a 14-inch wheel.

The new tire is made in tubeless form only, with nylon cords said to have a tensile strength of 52 pounds compared to 29 pounds for standard nylon tire cord. The tread is provided with extra thickness and this thickness plus the heavy nylon cord are reported to prevent punctures by small objects. A special inner wall compound is also used. The tire has an inch-and-a-quarter white sidewall made of a synthetic rubber especially compounded to resist ozone checking. It is also protected against scuffing above and below by patented curb guards. The new Royal Master is made in a full range of sizes to fit 14- and 15-inch rims.

Hayden Retires From DuPont

► Oliver M. "Bill" Hayden, a nationally recognized authority in the rubber industry, has retired after a 32-year career with the E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. One of Mr. Hayden's most significant contributions to the rubber industry was his success in working with both the automotive and rubber industries to adopt uniform specifications and tests. The American Society of Testing Materials presented him with an award of merit in 1954 for his contribution to the society's work on rubber and rubber-like material.

A native of Windsor, Conn., Mr. Hayden received an A.B. in chemistry in 1914 from Clark University, Worcester, Mass. He received an honorary Doctor of Science degree from Clark in 1955. Mr. Hayden started his DuPont career in 1926 as a compounder in the Technical Laboratory and was made manager of the Rubber Laboratory in 1929 when it was set up as an independent unit. In 1956, he was named special assistant for sales for the newly created Elastomer Chemicals Department. Mr. Hayden has written numerous papers on practical rubber technology and when synthetic rubbers were introduced, he and his ASTM committee developed tests which facilitated broad application of the new materials.



Oliver M. Hayden

Philadelphia Golf Outing

► Approximately 344 members and guests attended the Annual Summer Golf Outing of the Philadelphia Rubber Group on August 22 at the Manufacturers Country Club, Oreland, Penna. Events featured an eighteen-hole golf tournament, swimming, putting contests, tennis and a banquet. Table favors, consisting of cigarette lighters and pocket wallets, were given to everyone in attendance and after dinner, prizes were awarded to the winners of the various events. A total of 191 members and guests participated in the golf tournament directed by T. N. Loser (Wyrough & Loser). Golf prize winners were Wes Curtis (Naugatuck Chemical), *first place low gross;* Hank Pryor (R. E. Carroll), *second place;* John Powless (Carlisle Tire), *third place;* Frank Raba (Triangle Conduit), *closest to pin;* and John Stiff (Columbian Carbon), *longest drive*. Prizes were also awarded to all who scored birdies.

Daystrom Acquires Gauge Firm

► Daystrom, Inc., Murray Hill, N. J., has acquired for cash the business and assets of the Industrial Gauges Corp., West Englewood, N. J. The transaction included acquisition of the related patents owned by Charles B. Zimmer, president of Industrial Gauges. Industrial Gauges is a pioneer and major manufacturer of "non-contact" gauges, advanced instruments which use infrared, X-rays or visible light to determine thickness, density, width, diameter or other characteristics of materials. Mr. Zimmer, who formed the company in 1949, will continue with his present management in the Daystrom organization. The newly-acquired company will become the Industrial Gauges Department of Daystrom-Weston Industrial Division. Operations of this division include the production of process instrumentation, recorders, controllers, industrial instruments and computers.

Vetoes Cooper Tire Grant

► President Eisenhower has vetoed a congressional grant of $616,912 to the Cooper Tire & Rubber Co., Findlay, Ohio. The firm had charged it had lost money on seven contracts with the Army at the beginning of the Korean war. The President pointed out that the company made a net profit of more than $54,000 on 35 other government contracts in 1950-1952. In his veto message, he said "From the Government's standpoint, it would be inequitable to grant relief to the company with respect to the seven contracts on which it sustained losses, without giving consideration to the 28 on which it made profits. The granting of relief in this case would also be discriminatory against other contractors who sustained losses under fixed price contracts during the early part of the Korean conflict."

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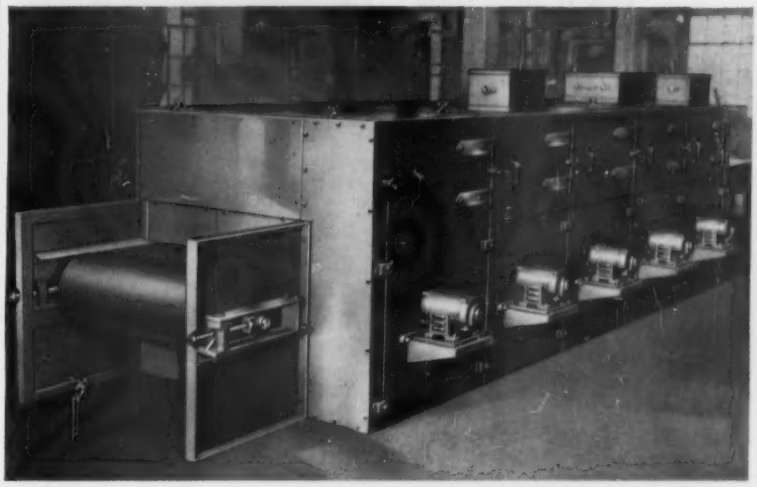

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Offers Technology Course

► The Quebec Rubber and Plastics Group, in cooperation with the Rubber Division of the Chemical Institute of Canada, has announced that the Extension Department of McGill University is presenting a course in Rubber Technology. Scheduled to have begun in October, the course will be divided into two semesters, consisting of ten lectures before Christmas and ten lectures in the new year. Each lecture will be of two hours duration and will be available in published form at the conclusion of the course. The same course is being presented in Toronto through the University of Toronto. The curriculum of the course includes History of Rubber Industry; Natural Rubber; Polymerization; SBR Synthetics; Butyl and Nitrile Synthetics; Neoprene, Hypalon, Polyurethane Elastomer; Reclaim, Thiokol, Silicone; Antioxidants, Antiozonants, Waxes, etc.; Carbon Black; Non-Black (Re-inforcement); Vulcanization (Accelerators); Latices & Foam Rubber; Testing Methods & Equipment; Art & Science of Compounding; Textiles & Fibres (Rayon, Nylon, Cotton); Production Machinery —Calenders; Production Machinery—Curing Equipment; Products—Tires, Footwear; Products—Industrial Rubber, Wire & Cable, and, Future Material & Processes.

Harwick Executive Appointments

► Harwick Standard Chemical Co., Akron, Ohio, has announced that D. F. Behney, vice-president of sales and a director since 1956, has been elected executive vice-president, while William L. Lasser, formerly purchasing agent and assistant warehouse superintendent, has been promoted to vice-president in charge of operations. The company has also elected Harvey G. Greer, formerly technical director, to the new position of vice-president in charge of technical development. At the Harwick manufacturing affiliate, Republic Dye and Chemical Co., Jack R. Moore, president of Harwick, has also been elected president of Republic. Frank A. Sancic has been named executive vice-president and Curtis J. Harwick, Jr., has been appointed vice-president in charge of development.

Hayhurst Named Vice-President

► Robert O. Hayhurst has been appointed vice-president in charge of manufacturing for the Biltrite Division of American Biltrite Rubber Co., Chelsea and Stoughton, Mass. This is a new position with the company, where Mr. Hayhurst has been factory manager for the past 10 years. A graduate of West Virginia University, Mr. Hayhurst is a member of the American Chemical Society and the Boston Rubber Group.

Dwight E. Zeller

Named Cyanamid Representative

► Pigments Division of the American Cyanamid Co., New York, N. Y., has appointed Dwight E. Zeller as sales representative for the metropolitan Chicago area, with headquarters at the Chicago sales office. With Cyanamid since 1946, when he joined the company's Organic Chemicals Division, Mr. Zeller has held various production supervisory posts at the Bound Brook, N. J., plant. He is a graduate of Purdue University and served as an officer with the United States Army during World War II.

Joins C. A. Litzler

► Ferd Muller, previously associated with the Textile Department of Walter Kidde & Co., Inc., has been appointed northeastern district representative for C. A. Litzler Co., Inc., Cleveland, Ohio. Mr. Muller's headquarters will be located in Montclair, N. J., and he will serve the New England States, New Jersey, Delaware, eastern New York and eastern Pennsylvania. While associated with Walter Kidde, he served as manager of sales and manufacturing, supervising both domestic and foreign operations.

Announces Personnel Changes

► Gene M. LeFave has been named director of research for the Chemical Division of the Coast Pro-Seal & Manufacturing Co., Los Angeles, Calif. At the same time, Russell W. Morey and Charles W. Morgan have been appointed plant manager and technical supervisor, respectively. The efforts of the new appointments will be coordinated under the supervision of L. C. Boller, vice-president of the Chemical Division.

Southern Ohio Lecture Series

► A series of six outstanding lectures on rubber technology have been scheduled for the 1958-59 season by the Southern Ohio Rubber Group to be held at the Engineers Club, Dayton, Ohio. The first lecture, "A Century of Rubber Research," was presented on September 29 by Dr. M. Morton, director of the Institute of Rubber Research of the University of Akron. Following are the subjects and speakers for the remaining lectures.

October 22—"Textiles—Their Applications In The Rubber Industry," speaker to be announced.

November 11—"Review Of Progress In Polymer Technology In Europe & USSR," by Dr. H. Mark (Polytechnic Institute of Brooklyn).

January 27, 1959—"Automotive Applications Of Rubber And Aeronautical Applications Of Rubber," by W. J. Simpson (Chrysler Corp.) and R. Dunsmoor (Boeing Aircraft).

February 24, 1959—"Properties Of Solid Polyurethanes," by Dr. Edgar Hardy (Mobay Chemical).

March 24, 1959—"The Economic Aspects Of The Rubber Industry," by W. J. Sears (Rubber Manufacturers Association).

Lee Rubber Staff Changes

► Joseph Gersbach, formerly head of factory development for the Research and Development Department of the Lee Rubber and Tire Corp., Conshohocken, Penna., has been appointed head of the compounding and development of tread rubber and tire repair materials. Mr. Gersbach's former post will be filled by Joseph Slater. The company has also announced the appointment of James Lloyd as manager of tire and tube compounding and Edward Gabuzda, who will be in charge of mechanical goods, chain store items and drug sundries development and compounding.

General Latex Buys Equipment

► Stein, Hall & Co., Inc., New York, N. Y., has sold a portion of its Long Island City latex compounding equipment to General Latex and Chemical Corp., Cambridge, Mass. Used to manufacture special rubber-based compounds for the carpet and casting industries, these compounds were previously offered for sale by Stein, Hall and are now available at General Latex plants in Cambridge, Mass.; Dalton, Ga.; Ashland, Ohio, and Charlotte, N. C.

An index to Volume 83 of RUBBER AGE will be found on pages 177 to 180 of this issue.

Akron Polymer Lecture Series

► The Akron Polymer Lecture Group has announced that its twelfth annual lecture series, conducted under the auspices of the University of Akron, has begun and will continue through spring. The lectures, presented by well-known members of the industry, will be held at the University at 8 P.M. on designated evenings. The first of the series, presented on August 14, was entitled "Polymeric Reaction Induced by Mechanical Deformation," by Dr. W. F. Watson (British Rubber Producers Research Association.) The second, to have been held on October 10, was entitled "A Soluble Catalyst for the Polymerization of Ethylene," by Dr. David S. Breslow (Hercules Powder). Other lectures have been scheduled as follows:

November 7—"Stereospecific Olefin Polymers," by Dr. Waller George (Celanese Corp. of America).

December 5—"Polymerization in Canal Complexes", by Dr. John F. Brown, Jr. (General Electric).

January 9—"Chain Configuration and Elasticity", by Dr. Paul J. Flory (Mellon Institute).

February 6—"Mechanical and Physical Chemical Properties of Diisocyanate-Linked Elastomers", by Dr. Thor L. Smith (California Institute of Technology).

March 6—"Helical Structures in Crystalline Polymers", by Professor R. E. Hughes (University of Pennsylvania).

April 3—"Viton Fluorocarbon Elastomers", by J. R. Pailthorp (DuPont).

May 1—"Plastics Can Be Tough", by Dr. P. M. Elliott (Naugatuck Chemical).

Wire and Cable Symposium

► The Seventh Annual Wire and Cable Symposium, sponsored jointly by the U.S. Army Signal Research and Development Laboratory and Industry, will be held on December 2, 3, and 4, at the Berkeley-Carteret Hotel, Asbury Park, N. J. About 25 papers reviewing technical progress during the past year in the field of communication wires and cables will be presented during the three day session. The symposium committee is again headed by Howard L. Kitts as chairman and H. F. X. Kingsley as co-chairman.

FMC Merges Two Divisions

► Food Machinery and Chemical Corp., New York, N. Y., has announced that its Ohio-Apex Division, formerly located in Nitro, West Va., has become a part of the Chemicals and Plastics Division of the company. Though production will continue at Nitro, the Division's offices will be located at 161 East 42nd St., New York 17, N. Y. The new telephone number is Murray Hill 7-7400.

Do you have a

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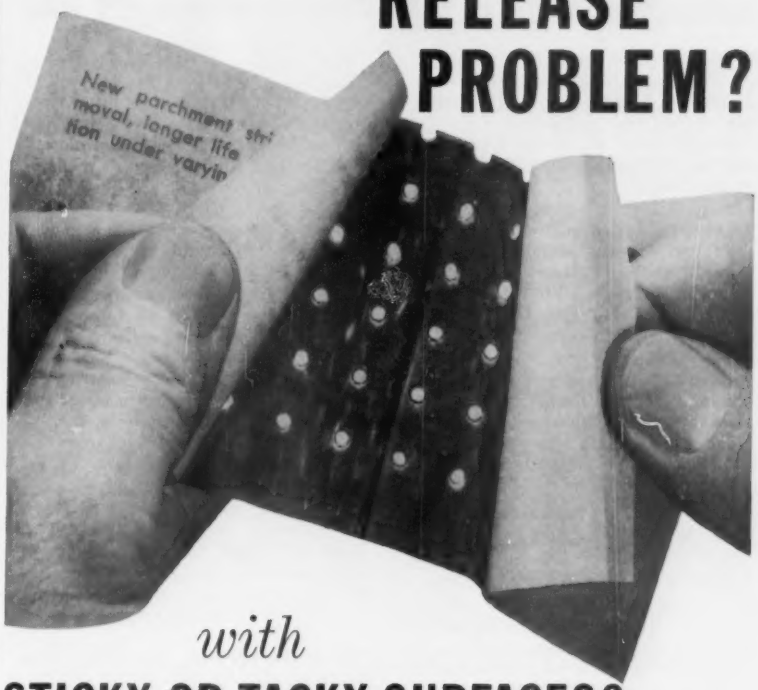

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HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

Names in the News

Thomas E. Moffitt, president, has been named chief executive officer of Hooker Chemical Corp., succeeding **R. Lindley Murray** who will continue as chairman of the board.

Thomas N. Parion, industrial lift truck sales and service specialist for more than 20 years, has been named sales manager for electric lift trucks by the Yale Materials Handling Division, Yale & Towne Manufacturing Co.

Robert J. Baker has been named purchasing agent, and **Donald H. Kattman,** assistant purchasing agent, for the Niagara Falls plant of the Durez Plastics Division of Hooker Chemical Corp.

D. H. Killeffer, chemical public relations consultant, is moving his headquarters from Tuckahoe, N.Y., to 1033 Mohawk Drive, Clearwater, Fla.

John M. Richard has been appointed New York district sales manager for the Westvaco Chlor-Alkali Division of Food Machinery & Chemical Corp. Other sales department appointments include **John R. Jacobucci** named Alkali product manager, **Robert E. Cochran,** assistant Alkali product manager, and **Charles E. Kaneen,** assistant to the sales manager.

Frederick T. Koyle, of the firm of Carl M. Loeb, Rhoades & Co., vice-president and member of the Board of Directors of Commodity Exchange, Inc., president and director of Commodity Exchange Rubber Clearing Association, Inc., and chairman of the board of directors of the Rubber Trade Association of New York, Inc., will serve as chairman of the Rubber Division of the 53rd annual appeal of the Travelers Aid Society of New York.

Theodore R. Goebel, formerly vice-president of the Mid-Continent Oil & Gas Division, has been elected executive vice-president of the Columbian Carbon Co.

Abram W. Hatcher, who was formerly a patent coordinator for the Thiokol Chemical Corp., has joined the New Products Research Department of Godfrey L. Cabot, Inc., as a patent attorney.

S. F. Spence, director of Safety and Loss Prevention for American Cyanamid Co., has been elected chairman of the Manufacturing Chemists' Association's General Safety Committee.

Frank Lindeman, Jr., has been named a president of United Producing Co., a subsidiary of United Carbon.

Charles A. Polachi, formerly vice-president and director of Columbian Carbon International, has been elected president and will continue as a director of the organization.

Charles J. Snyder has been named president of Ace Rubber Products succeeding Floyd C. Snyder, founder of the firm, who has been named to the newly created position of chairman of the board.

Eustace Lingle has been appointed vice-present in charge of industrial sales and education for Oakite Products, Inc.

Thomas R. McMannus has been appointed to the sales staff of the Colonial Rubber Co., Ravenna, Ohio.

Louis Meyerhoff, chief research engineer of the General Cable Corp., has been made a Fellow of the American Institute of Electrical Engineers.

Edgar H. Spilman has resigned as executive vice-president and as a member of the board of directors of the Frank G. Schenuit Rubber Co.

David H. Simonds has been appointed to the position of coordinator of advertising and merchandising for the Plastics Division of the General Tire & Rubber Co.

L. Burt Avery has been named vice-president and general manager, and **Donald J. Unger** has been named plant manager of the Sequoia Wire & Cable Co., Redwood City, Calif.

Albert L. Rhoton was named vice-president in charge of technical services at the Keokuk, Iowa, plant of the Sheller Manufacturing Corp.

C. E. Carlson, superintendent, and **J. J. Casey,** assistant superintendent of rubber plants at Humble Oil & Refining, Baytown, Texas, have retired after over 30 years of service each.

Theodore E. Smith has been appointed manager of sales training for the Mechanical Goods Division of U. S. Rubber Co.

Dr. Malcolm B. VerNooy has been promoted to product manager in the New Chemicals group of the Union Carbide Chemicals Co.

Martin H. Gurley, Jr., has been appointed to the newly-created position of new product analyst of the Vulcan Rubber Products Division of Reeves Brothers, Inc.

Lawrence H. Bruce

Named Naugatuck Sales Manager

► Lawrence H. Bruce has been appointed sales manager of latices for the Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn., in which position he will be responsible for planning the sales activities of all basic latices produced and sold by the division. Mr. Bruce, formerly assistant sales manager for colloidal products, joined Naugatuck Chemical as a trainee in the Production Department in 1940. In 1951, he was appointed a process engineer and the following year, he was assigned to the Sales Department. He was a technical sales representative in Naugatuck, Conn., New York City and Akron before he was named assistant sales manager in 1957. Mr. Bruce has a degree in chemical engineering from Northeastern University, Boston, Mass.

L. George Hoth, formerly merchandising manager of the Consumer Products Department, has been appointed manager of advertising and merchandising for the Borden Chemical Co., New York, N. Y.

Merrill M. Smith has been appointed to the recently created post of vice-president in charge of manufacturing for the Amtico Vinyl & Rubber Flooring Division of American Biltrite Rubber Co., Trenton, N. J.

Thomas D. Ramsey, formerly Los Angeles area technical sales representative, has been appointed district sales manager for the Gastonia, N. C., area of the Naugatuck Chemical Division, U. S. Rubber Co.

William L. Solt, who was formerly a sales promotion specialist with B. F. Goodrich, has been appointed director of advertising for Goodrich - Gulf Chemicals, Inc., Cleveland, Ohio.

Akron Group Begins Season

► Three proposed changes to the constitution and bylaws will be presented at the opening meeting of the Akron Rubber Group to be held on October 24. The first of these amendments is in regard to a change in the fiscal year. The organization proposes to operate from August 1 to July 31, and officers will assume duty on August 1 instead of July 1. The second proposal is concerned with filling vacancies in elected offices, whereby a system of succession within the executive body has been proposed. The last amendment proposes that the complement of the nominating committee consist of the present chairman and the two most recent available past chairmen, plus two other members from the membership at large. These changes will be officially presented at the meeting and will be voted on by mail at a later date. The Akron Group recently contributed toward the purchase of a laboratory press and an Instron tester for the University of Akron which is currently celebrating its 50th Anniversary of the teaching of rubber chemistry.

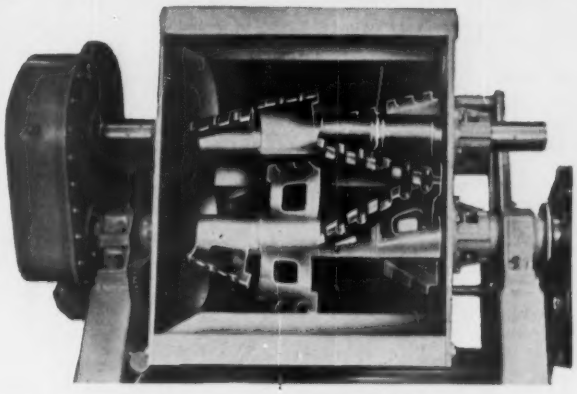
R. B. Knill, chairman of the Program Committee, announced that a symposium entitled "Tire Testing Methods" will be held at the opening meeting in the Sheraton Hotel, Akron, Ohio. The panel members and their topics are as follows: "Tire Laboratory and Machine Testing," W. F. Perkins (Goodrich); "The Use of High Speed Photography in the Rubber Industry," F. S. Conant (Firestone); "Winter Tire Testing," A. H. Easton (University of Wisconsin); "Tire Noise Evaluation," J. W. Drew (Goodyear), and "Reliability of Treadwear Testing," F. C. Leone (Case Institute of Technology).

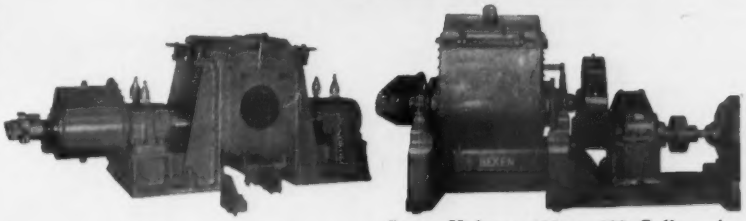
Huisking Acquires Glyco Products

► Chas. L. Huisking & Co., a leading merchandiser and manufacturer of raw materials for the pharmaceutical industry, acquired the assets of Glyco Products Co., New York, N. Y., as of August 22. Glyco Products, producers of chemicals for the plastics, paint and textile industries, will be formed into a new corporation, Glyco Chemicals Corp., and will function as a manufacturing and sales subsidiary. In acquiring Glyco, Huisking officials said that the firm is taking the necessary steps to expand its research and manufacturing position, broaden its markets and serve the needs of its customers more efficiently. The newly formed Glyco Chemicals Corp. will continue to operate its Williamsport, Penna., plant. This facility has 150,000 square feet located on more than 40 acres of land, and employs 100 people.

An index to Volume 83 of RUBBER AGE will be found on pages 177 to 180 of this issue.

Why It's **BRAMLEY-BEKEN** *Today*





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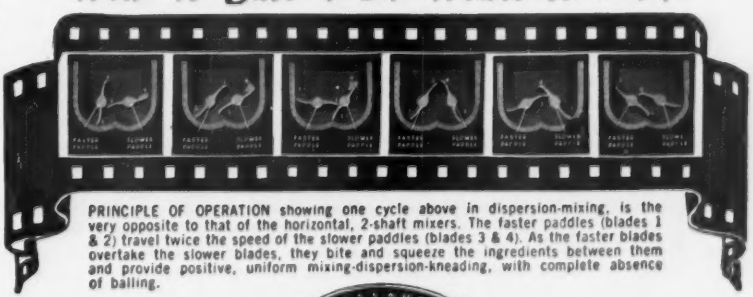
Because **MOST EFFICIENT . . . MOST ECONOMICAL . . . MOST PRODUCTIVE MIXER . . . DISPERSER . . . KNEADER**

For Rubber Cement and Other Rubber Products

The Bramley-Beken cuts time tremendously! All power goes into productive work. Only that part of the mass being squeezed between the *multiple* paddle blades is worked on *at any one time.* Hence, saving in power per batch . . . increased productivity . . . less operating and maintenance costs . . . faster output . . . and a better end-product. The selection of the Bramley-Beken by America's top leaders has been the result. Laboratory and pilot test facilities are available.

How It Cuts 4-24 Hours to 1-4!



PRINCIPLE OF OPERATION showing one cycle above in dispersion-mixing, is the very opposite to that of the horizontal, 2-shaft mixers. The faster paddles (blades 1 & 2) travel twice the speed of the slower paddles (blades 3 & 4). As the faster blades overtake the slower blades, they bite and squeeze the ingredients between them and provide positive, uniform mixing-dispersion-kneading, with complete absence of balling.

MECHANICAL ENGINEERS

Bramley Machinery Corporation

880 R RIVER ROAD EDGEWATER, N. J.

New Goodyear Mixer Blends Antioxidants

► Goodyear Tire and Rubber Co. has installed a new 200-gallon capacity mixer at its Akron, Ohio, plant, which is said to permit swift and uniform homogenization of antioxidants to stabilize Chemigum synthetic rubber. Previously, Goodyear used standard propeller type agitators to mix antioxidants in a 200-gallon kettle. This propeller type unit has been replaced with a homo-mixer, manufactured by Gifford-Wood Co., Hudson, N. Y.

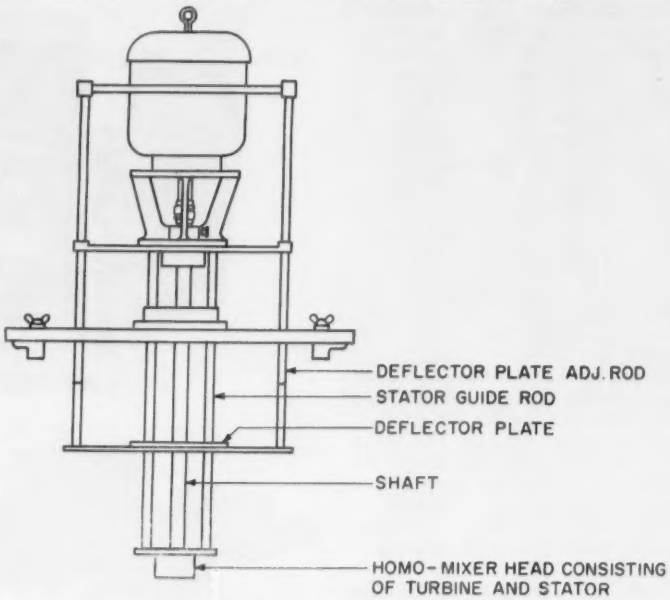
The unit blends and homogenizes the antioxidants in 15-20 minutes at medium temperatures. The top-entering unit has a flanged "bridge" support welded to the kettle cover plate. Mixing and homogenizing is done by a "homogenizing head" positioned near the bottom of the kettle. This head is connected to a 10 horsepower motor by a shaft assembly consisting of rigid guide rods and coupling shaft.

A precision turbine-stator, assembly located within the homogenizing head, performs the actual work of mixing, pumping and shearing. The turbine, rotating at 3500 rpm., acts as a pump to draw material from the bottom of the kettle. As the material passes through the turbine-stator housing, it is forced through restricted openings which exert intense forces of impact and hydraulic shear, reducing the material to uniform fine particle size.

Thorough Mixing

Discharged through the top of the head, the material is deflected up and outward by a baffle plate, setting up a circular movement of material which forces unmixed material downward and into the mixing zone. Air entrainment is avoided because material is drawn from the bottom of the tank and vortex does not occur. Hydraulic shearing of the materials is said to bring about desirable changes. Reduction to fine particles gives the emulsion increased stability and because the surface area of the emulsion becomes greater as particle size is reduced, its speed of reaction of assimilation is stepped up and tendency to separate is reduced.

With the formerly utilized propeller type unit, the whirling blades set up an intense local mixing action, which largely depended upon a vortex effect (or whirlpool) to create flow currents of the materials. This type of action is most effective for mixing free-flowing fluids. However, when high viscosity materials are to be mixed, it is sometimes found that if the agitating action of the propeller is not strong enough, some material will stratify. An inherent disadvantage of the propeller unit as applied to antioxidant mixing is that the vortex effect permits uncontrolled air entrainment.



Sketch of mixer installed at Goodyear plant.

Buys Wink Cutter Division

► Motch & Merryweather Machinery Co., Cleveland, Ohio, has announced the acquisition of the Wink Cutter Division from F. J. Fink & Co. The Wink Cutter is a high speed precision machine used for cutting rubber, plastic, textile fiber and many other hot or cold extruded materials at high speed. The complete line of Wink equipment includes several models of basic cutters and metoveyors which can form completely automatic units for integration into an automated extrusion line. At the beginning of this year, Motch & Merryweather consolidated its Cleveland manufacturing operations and sales headquarters in its expanded factory and office at its Euclid plant, where Wink equipment will be produced. Frank J. Fink will join Motch & Merryweather as manager of the newly acquired division.

Armour Expands Research Unit

► Plans for construction of a multi-million dollar 125,000 square-foot chemistry and chemical engineering building have been announced by the Armour Research Foundation of Illinois Institute of Technology, Chicago, Ill. The proposed three-story brick and reinforced concrete structure has been designed to match the modern architecture of the other buildings on the Illinois Tech campus. The new chemistry facility will be the third building in the ten year expansion program begun by Illinois Tech two years ago. A physics and an electrical engineering unit have been completed already.

Copolymer Technical Staff Changes

► Copolymer Rubber & Chemical Corp., Baton Rouge, La., has announced several appointments to the company's Research, Development, Technical and Sales Departments. Ernest O. Tucker and Grover C. Royston have been assigned to the Research Department as chemists. Mr. Tucker is a recent graduate of Mississippi University, Oxford, Miss., while Mr. Royston is a graduate of Centenary College, Shreveport, La. Kenneth Wirth, formerly associated with the St. Clair Rubber Co., Marysville, Mich., has been named development laboratory supervisor in the Development Department. Other appointments to this department include Rodney J. McGarry as chemical engineer and Billy D. Butler as chemist. Both Mr. McGarry and Mr. Butler had been with the Kaiser Aluminum Co. in Baton Rouge, La. Bobby Argrave, a graduate of Louisiana State University, has been named chemical engineer in the Technical Department. Grant C. Rickard has been assigned to handle technical sales in the Sales Department. Mr. Rickard was formerly associated with Southern States Chemical Co. in Atlanta, Ga.

Seward Named Vice-President

► The board of directors of General Latex and Chemical Corp. (of Ga.) has named W. W. Seward vice-president of the company. Along with his vice-presidential duties, Mr. Seward will retain his position as general manager.

...with FURNEX® SRF for optimum balance

To match the most precise specifications for achieving optimum balance ... Columbian produces Furnex ... semi-reinforcing furnace black. For *any* requirement where rubber with special characteristics is desired ... Columbian's wide range of other blacks assures superior results. Extensive research on carbon black characteristics ... plus precise production control ... enable Columbian to provide the perfect carbon black for every requirement.

COLUMBIAN CARBON COMPANY

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TURN PAGE

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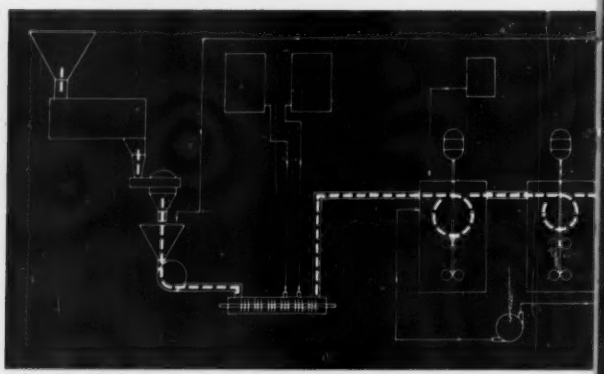
Columbian pioneered with reinforcing carbon blacks... created MICRONEX more than four decades ago... made it a synonym for reinforcement! Today, Columbian's MICRONEX is the industry's standard for natural rubber, heavy-duty, truck tires... and heavy-duty insulation for wire and cables.



BECAUSE...

Columbian is responsible for so many major steps ahead... developments like the latex masterbatching process which has spurred the whole industry to vital new progress!

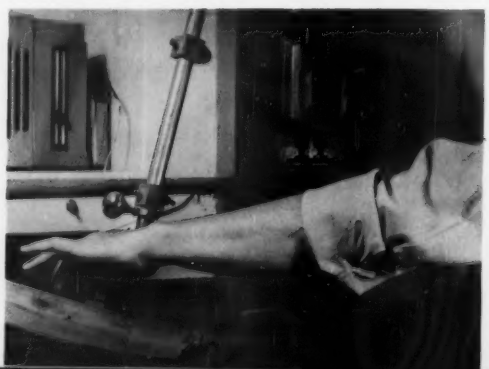
BECAUSE...

Columbian has a carbon black for every need.

STATEX®-160 SAF Super Abrasion Furnace
STATEX®-125 ISAF Intermediate Super Abrasion Furnace
STATEX-R HAF High Abrasion Furnace
STANDARD MICRONEX® MPC Medium Processing Channel
MICRONEX W-6 EPC Easy Processing Channel
STATEX-B FF Fine Furnace
STATEX-M FEF Fast Extruding Furnace
STATEX-93 HMF High Modulus Furnace
STATEX-G GPF General Purpose Furnace
FURNEX® SRF Semi-Reinforcing Furnace

BECAUSE...

In a laboratory that has made many important contributions to the industry... Columbian specialists work endlessly with rubber formulations ... test and retest until results meet the most exacting specifications!



COLUMBIAN CARBON COMPANY
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Financial News

Dayton Rubber

► Nine months ended July 31: Net income of $819,141, which is equal to 73c a share, compared with $1,304,-162, or $1.32 a share, in the equivalent nine month period of 1957. Sales in the nine months to July 31 totaled $60,550,983, compared with $59,872,-283, during the same period last year.

Midwest Rubber Reclaiming

► Nine months to July 31: Net income of $531,852, which is equal to $1.75 per common share, compared with $538,432, or $1.92 a share, in the corresponding period of 1957. Net sales for the 1958 fiscal nine month period totaled $6,848,407, compared with $7,111,014, during the same period last year.

Pierce & Stevens

► Six months to June 30: Net income of $241,200, which is equal to 74c a share, compared with $229,500, or 71c a share, in the same period last year. Sales amounted to $3,907,700 in the first half of 1958 compared with $3,-740,900 in the same period last year.

Sheller Manufacturing

► Six months to June 30: Net loss of $163,832 as compared with a net income of $1,152,963, which is equal to $1.21 per common share, in the corresponding period in 1957. Sales in the six months to June 30 totaled $12,852,-521 compared with $22,375,385 during the same period last year.

National Rubber Machinery

► Six months to June 30: Net loss of $145,116, compared with a net income of $215,951, or $1.05 in the first half of 1957. Sales in the first six months of this year totaled $4,005,442, compared with $7,654,069, in the same period of the preceding year.

New Jersey Zinc

► Six months to June 30: Net income of $99,848, which is equal to 5c per share, compared with $1,704,219, or 87c a share, in the first six months of 1957.

Baldwin Rubber

► Year to June 30: Net income of $387,437, which is equal to 91c a share, compared with $664,747, or $1.55 a share, in fiscal 1957.

Morningstar-Paisley

► Six months to June 30: Net income of $250,911, which is equal to 50c a share, compared with $228,209, or 46c a share, in the same period last year. Figures for both years are based on 494,255 shares outstanding. Consolidated sales for the first half of 1958 amounted to $10,737,936, compared with $9,728,767 for the same period a year ago.

Witco Chemical

► Six months ended June 30: Net income of $765,700, which is equal to $1.71 per share, compared with $638,-800, or $1.05, in the first six months of 1957. Sales in the first half of 1958 totaled $18,268,300, compared with $19,750,800 during the same period last year.

Borden

► Six months to June 30: Net income of $11,263,038, which is equal to $2.31 a share, compared with $11,402,120, or $2.33 a share, in the same period last year. Sales for the first half of 1958 totaled $449,588,054, easing about 1 per cent from the record sales mark of $454,052,226 set in the comparable 1957 period.

United Engineering

► Six months to June 30: Net income of $2,726,739, which is equal to $1.10 per common share, compared with $2,-738,051, or $1.10 a share, in the six month period last year. Sales in the first six months of this year totaled $51,098,201, compared with $41,040,-759 during the same period in 1957.

Anaconda Wire & Cable

► Six months to June 30: Net income of $238,358, which is equal to 28c per share, compared with the 1957 first half earnings of $3,359,208, or $3.98 per share.

► A new ribbed design "Griptite" package conveyor belt that is self cleaning is featured in a new data sheet published by B. F. Goodrich Industrial Products Co., Akron, Ohio.

► Wire and Cable Section of the National Electrical Manufacturers Association has revised a 1954 compilation of trade marks and trade names of insulating materials and bare and insulated wire and cable used in the electric power field.

James C. Donald

Joins Dewey and Almy

► James C. Donald has joined the organic chemicals sales force of the Dewey and Almy Chemical Division of W. R. Grace & Co., Cambridge, Mass. He will serve in a home office capacity, specializing in the extension and development of markets for the firm's vinyl acetate polymer and copolymer emulsions; styrene-butadiene latices and resins, dispersing agents, and plasticizers. Mr. Donald was formerly with Air Products, Inc., Allentown, Penna., and E. I. du Pont de Nemours & Co., Wilmington, Del. He holds a B. S. in chemical engineering from Stanford University and an M. B. A. from the Harvard School of Business Administration.

Help Wanted

► Naval Air Material Center, Philadelphia, Penna., has an urgent need for qualified electronic scientists, metallurgists, physicists, technologists and engineers. The Center is currently engaged in an extensive program of aeronautical research, development, experimentation and test operations for the advancement of Naval aviation and experimental work in the guided missile field. Starting salaries for the positions range from $4490 to $8330 per annum. Application for Federal Employment, Standard Form 57, should be filed with the Industrial Relations Department, Naval Air Material Center, Naval Base, Philadelphia 12, Penna. Applications may be obtained from the above address or information as to where they are available may be obtained from any first or second class post office.

Fred H. Amon

Retires From Cabot

► Fred H. Amon, technical director and consultant for Godfrey L. Cabot, Inc., Boston, Mass., has retired from that organization, effective October 1. Mr. Amon was born in Greenville, Penna., and received his M.S. from Allegheny College in Meadville, Penna. In 1917, he joined the B. F. Goodrich Co., where he was associated with George Oenslager, a pioneer in rubber technology and the use of carbon black in rubber. Mr. Amon's work at Goodrich took him into the fields of research, mechanical goods compounding, pigments control and development, and tire development. He joined Cabot in 1930 as technical director and was in charge of the company's laboratories. Since 1942, he has devoted his full time to technical sales and service.

In his work with the company and his affiliation with various technical organizations, Mr. Amon has written and presented many technical reports and papers; has worked with government agencies and committees interested in the carbon black and rubber industries, and has helped develop many of the techniques and procedures used in these industries today. A member of the American Chemical Society and several rubber groups, he has served as director in the Rubber Division of the Society. He has also been a member of the Chemists' Club of New York, the American Institute of Chemical Engineers and the American Association for the Advancement of Science.

Executive Appointment Announced

► A. B. Peterson, formerly marketing vice-president, has been appointed executive vice-president of International Latex Corp., New York, N. Y. In his new capacity, Mr. Peterson will be in charge of all product research and development for the manufacturing and marketing of the Playtex line of girdles, bras, baby products and drug sundries.

Pigments Club Meetings Planned

► A program for the coming year of general interest to members of the paint and pigment industry has been announced by the New York Pigment Club. The first meeting of the 1958-59 season was to have been held on September 11 at Fraunces Tavern in New York City and was to have featured Joseph J. Quinn, Jr., (Bowen Engineering) as guest speaker. Mr. Quinn was to have spoken on the subject, "Adapting The Spray Drying Process to Pigment Manufacture." Following is a calendar for the remainder of this season's activities:

October 9—Hugh F. Purcell (Morehouse-Cowles) who will speak on "Modern Pigment Dispersion Methods."

November 13—John H. L. Watson (M. W. Freeman) speaking on "Practical Applications of Submicron Crystal Pigments."

December 11 — Louis J. Venuto (Columbian Carbon) whose topic will be "The Special Factors Influencing Carbon Black Dispersions."

January 9, 1959—R. L. Whitney and R. P. Bates (National Lead), who will talk on "New Developments in Corrosion Inhibitive Pigments."

Harwick Names Representative

► Harwick Standard Chemical Co., Akron, Ohio, has appointed C. R. Simpson, formerly associated with the B. F. Goodrich Co., as technical sales representative. He will work out of the company's Akron office and will contact accounts in Ohio, western Pennsylvania and West Virginia. Mr. Simpson is a graduate of Baldwin-Wallace College with a degree in chemistry and has had experience in various phases of chemistry and chemical purchasing. A veteran of the Korean conflict, he is a member of the Akron Rubber Group and the Division of Rubber Chemistry of the American Chemical Society.

C. R. Simpson

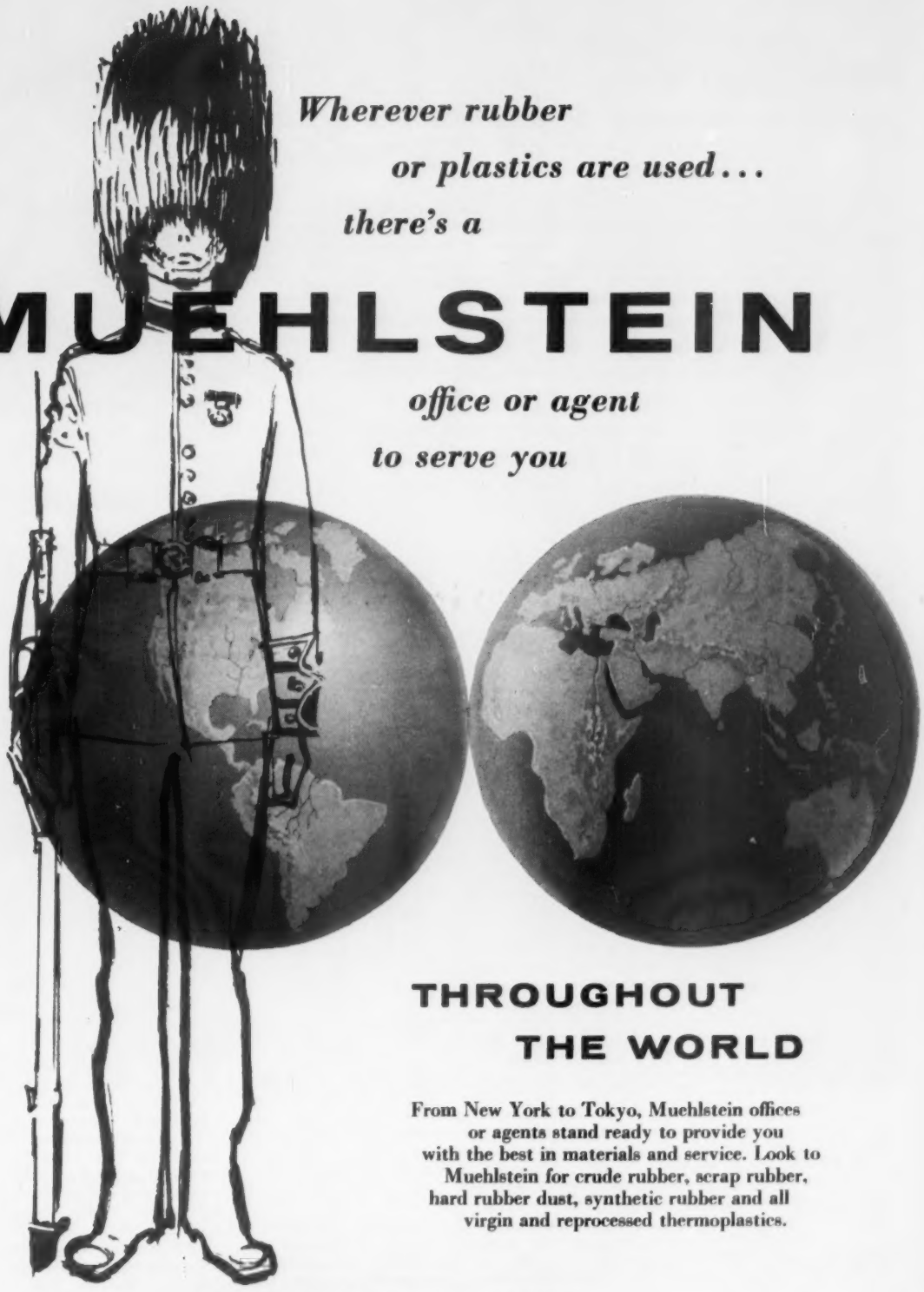
James C. Richards, Jr.

Named Goodrich Vice-President

► James C. Richards, Jr., has been named vice-president, sales, for the B. F. Goodrich Industrial Products Co., Akron, Ohio, succeeding R. V. Yohe, who has been elected president and chief executive officer for B. F. Goodrich Canada. Mr. Richards, who was formerly vice-president, sales, for the B. F. Goodrich Chemical Co., is a graduate of Kansas State College with a degree in chemical engineering. He joined the company's general chemical laboratories in Akron, Ohio, in 1934 and after three years as a chemical engineer in the Reclaim Rubber Department, he was made general foreman in the company's plants in Akron. In 1943 he became production manager of a government man-made rubber plant in Louisville, Ky., which was built and operated by Goodrich, and the following year was appointed plant manager of another government rubber-making plant in Borger, Texas, also built and operated by the company. After the end of World War II, Mr. Richards was made head of Hycar and chemical sales for the Goodrich Chemical Co., and in 1949, manager of International sales for that division. He is a member of the American Institute of Chemical Engineers, the American Chemical Society and the Chemists' Club of New York. He also belongs to the Cleveland, Ohio, Sales Executives Club, Kiwanis International, and is a director in the Cleveland World Trade Association.

Berco Latex Moves Facilities

► Berco Latex Corp., formerly of Caldwell, N. J., has moved its plant, laboratories and offices to improved and increased facilities at 1250 Shames Drive, Westbury, Long Island, N. Y. The new building and plant were specifically designed for Berco's operations and to provide more efficient service for their customers.



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West Coast News

► The technical meeting of the Los Angeles Rubber Group, Inc., scheduled for 5:30 p.m. on October 7, was to have featured a film on "High Speed Photography in the Rubber Industry," prepared by G. L. Hall, J. D. Rigby and F. S. Conant (Firestone). Comments on the handling of this film were to have been made by N. R. Pestal (Firestone, Los Angeles). An informative technical article on this subject, written by the Messrs. Hall, Rigby and Conant, appeared in the May, 1958, issue of RUBBER AGE. The film described some of the techniques and applications of several types of high speed photography, especially the high speed camera, which have been found to be useful in different phases of the manufacture and testing of high polymeric materials.

At the Tlargi dinner meeting, to have been held on the same evening at 7 p.m. at the Biltmore Hotel, Los Angeles, Calif., the group was to have presented a program sponsored by American Latex Products Corp., Hawthorne, Calif., at which Dr. L. E. Vredevoe, professor of education at U.C.L.A., was to have spoken on "The Seven Dwarfs You Will Meet After Dinner." This meeting represents the first sponsorship for American Latex, which was incorporated in June, 1946, and was acquired by the Dayton Rubber Co. in 1952. Since its inception, the company has widely expanded the use of foam rubber and allied products for the furniture, bedding and diversified industries. Operating in a modern plant, American Latex, with its division, Pacific Polymers, covers a site of 425,000 square feet and employs 400 to 500 people.

The sixth Tlargi outing of 1958 was held at the Wilshire Country Club on September 19, with 43 golfers in attendance. Prize winners included M. L. Butler—*First low net (tie);* D. P. O'Connell—*First low gross;* J. L. Dum—*Second low net (tie);* M. D. Moon—*Second low gross;* Joe Hoefle—*Longest putt;* J. P. Ballesio and R. E. Davis—*Blind bogey (tie);* G. E. Lucas—*Consolation prize, high gross.* The final Tlargi golf outing for this year was to have been held on October 17 at the new Los Coyotes Country Club at Buene Park, Calif.

► W. J. Voit Rubber Corp., Los Angeles, Calif., a subsidiary of the American Machine & Foundry Co., has started construction of a 60,000 square foot factory and office building for its Tread Rubber and Tire Repair Materials Division. To be located in Santa Ana, Calif., the cement tilt-up-style structure will appear to have one story from the outside, but underground installation of heavy rubber processing equipment will make production a two floor operation. New equipment will include a No. 11 Farrel-Birmingham Banbury; a 15" Farrel-Birmingham Extruder; cooling conveyors; automatic slab cutting and stacking facilities; automatic carbon black handling equipment, and automatic oil handling equipment. Patents are being applied for on many of the features of the automatic materials. Scheduled for full operation July 1, 1959, total investment for the building and equipment is set at $2,000,000.

► The Los Angeles plant of the B. F. Goodrich Co. has put its new tire curing equipment into operation and expects the new presses to increase tire production by 15 per cent. The new equipment represents a capital investment of $500,000. A company spokesman said that the electronic control would now make tire curing virtually automatic. He pointed out that the curing presses do not eliminate manpower, but provide better control of the tire curing cycle and simplify the operators' work.

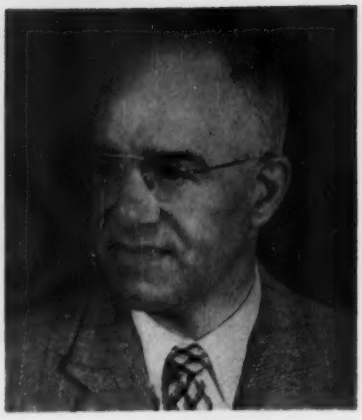
► W. N. Cargile, sales manager for American Latex Products Corp., Hawthorne, Calif., has been elected to membership in the Los Angeles Sales Executives Club. The Club annually sponsors the Los Angeles Sales Rally, Salesmen's Recognition Week, Junior Achievement, the Sales Management Conference, Boy's Day in Business and other services and special events.

► Firestone Tire & Rubber Co. of California recently celebrated the company's 30th anniversary and the production of its 55 millionth automobile tire. Norris Poulson, mayor of Los Angeles; Burton W. Chace, Los Angeles County supervisor; and George B. Gose, president of the Los Angeles Chamber of Commerce, attended the event.

► Gordon L. Newby has acquired the operation of Tillotson at Bakersfield, Calif. Mr. Newby offers various types of rubber application service in the oil fields.

► George Morris, formerly associated with Pacific Polymers, has joined Orcco Industries as chief chemist.

► James Carpenter has been named factory manager for the Dahlman Products Co., Redlands, Calif.



F. L. Kilbourne, Jr.

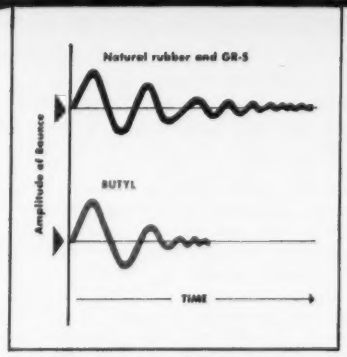
Named Operations Manager

► Midwest Rubber Reclaiming Co., East St. Louis, Ill., has appointed Dr. Frederick L. Kilbourne, Jr. as manager of operations of the Barberton, Ohio, facility. He replaces Ray R. Semler who passed away last July. Dr. Kilbourne holds a Ph.D. degree from Massachusetts Institute of Technology, a master's degree from Akron University and a B.S. in chemistry from Brown University. He was formerly employed as manager of research and development for the Connecticut Hard Rubber Co., and prior to that he was with the Xylos Reclaiming Division of Firestone. Dr. Kilbourne has been associated with Midwest in the capacity of technical consultant since January of this year. He is a member of the Rubber Division of the American Chemical Society, and the Akron, Connecticut and Washington Rubber Groups.

Economical Mold Release Agent

► Use of rubber mold release agents of a high viscosity rather than those of a low viscosity would permit tire manufacturers and retreaders to effect considerable economies, according to the Silicones Division of Union Carbide Corp., New York, N. Y. Silicone emulsions generally in use are of an average viscosity of about 300 to 500 centistokes. A more recent emulsion, Union Carbide "LE-46" containing 10,000 centistokes fluid, has been used at several rubber companies within the last year and has been found to be both highly effective and economical. Because of its high viscosity, the fluid provides a more substantial film at mold temperature and lasts longer, the company states. LE-46 is an oil in water emulsion with excellent stability. It has a concentration of 35 per cent by weight silicone oil, and weighs 8.27 pounds per gallon.

BEST WAY TO ABSORB SHOCK!



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Canadian News

► Robert V. Yohe has been elected president and chief executive officer for B. F. Goodrich Canada, while Ira G. Needles, president of the firm since 1951, has been named chairman of the board. Mr. Yohe, formerly vice-president, sales, for B. F. Goodrich Industrial Products Co., has been with the firm since 1931, when he started as a research chemist at its laboratories. He became manager of the General Chemical Laboratories in 1936; a technical superintendent of sundries sponge rubber and latex products in 1939, and assistant director of synthetic rubber

◄ Needles

Yohe ►

research in 1942. Mr. Yohe was a technical superintendent of the Goodrich Chemical Division when he assumed the direction of a synthetic rubber plant in Louisville, Ky., which was built and operated by the company for the United States government during World War II. In 1946, he was named president and general manager of American Anode, Inc., a company division, and in 1953, he was named vice-president of sales for B. F. Goodrich Industrial Products Co. Mr. Needles has served B. F. Goodrich Canada Ltd. for thirty-three years. He was assistant sales manager of the Canadian company's Tire Division until 1930, when he was made general tire sales manager. In 1945, he was elected vice-president, sales, and was named president in 1951.

► Polymer Corp., Sarnia, Ont., has announced the initiation of a new program to meet sharpening competition in overseas markets. The company has reduced the price of general purpose products from 24.1c to 23.25c per pound and has geared its sales force for a renewed drive into the growing synthetic market. Polymer states that the price cut was a direct result of underselling the "official" published price by United States exporters to the United Kingdom and Europe. The firm believes that the price-cutting by American firms was sparked by lagging domestic sales in the first half of this year and that it also reflects the expansion of plant capacity that has taken place in the United States in recent years.

Polymer states that it is selling "substantially all" current output. Production of the Sarnia firm this year is expected to top last year's record 130,000 tons, perhaps reaching 140,000 tons or better. However, over-all rubber consumption in the Canadian market was down about 17 per cent in the first six months of this year, reflecting slacker business conditions. Outlook for the last half and for early 1959 is better Polymer officials believe. They state that this forecast is backed by those of the Rubber Association of Canada, whose members represent 90 per cent of domestic consumption.

► Harley O. Allman, one of the pioneers in Goodyear-Canada operations, has retired as special assistant to the vice-president at the New Toronto plant after 48 years of continuous service with the company. Mr. Allman joined Goodyear Tire & Rubber Co., Akron, Ohio, in 1910, in the tread room. Two years later he became a product inspector; in 1913, he was made foreman in the tire section, and six years after that, he was promoted to general foreman. Mr. Allman was transferred to the New Toronto plant in 1922 as superintendent of Division "B" and in 1943 was promoted to plant manager. He served in that capacity until he was named special assistant to the vice-president of the Canada plant in 1957.

► Mansfield Rubber (Canada) Ltd., established in Barrie, Ont., in 1955 by the Mansfield Rubber Co. and Denman Rubber Manufacturing, Warren, Ohio, has manufactured its one-millionth tire. The company, which is said to have had an unbroken record of sales growth, recently increased its manufacturing space from 70,000 square feet to 100,000 square feet. Company officials say, "From the date of starting to manufacture, there has not been one man laid off and production has been continuous 24 hours per day with a minimum five-day week." Mansfield Rubber at Barrie manufactures auto and truck tires for the replacement market.

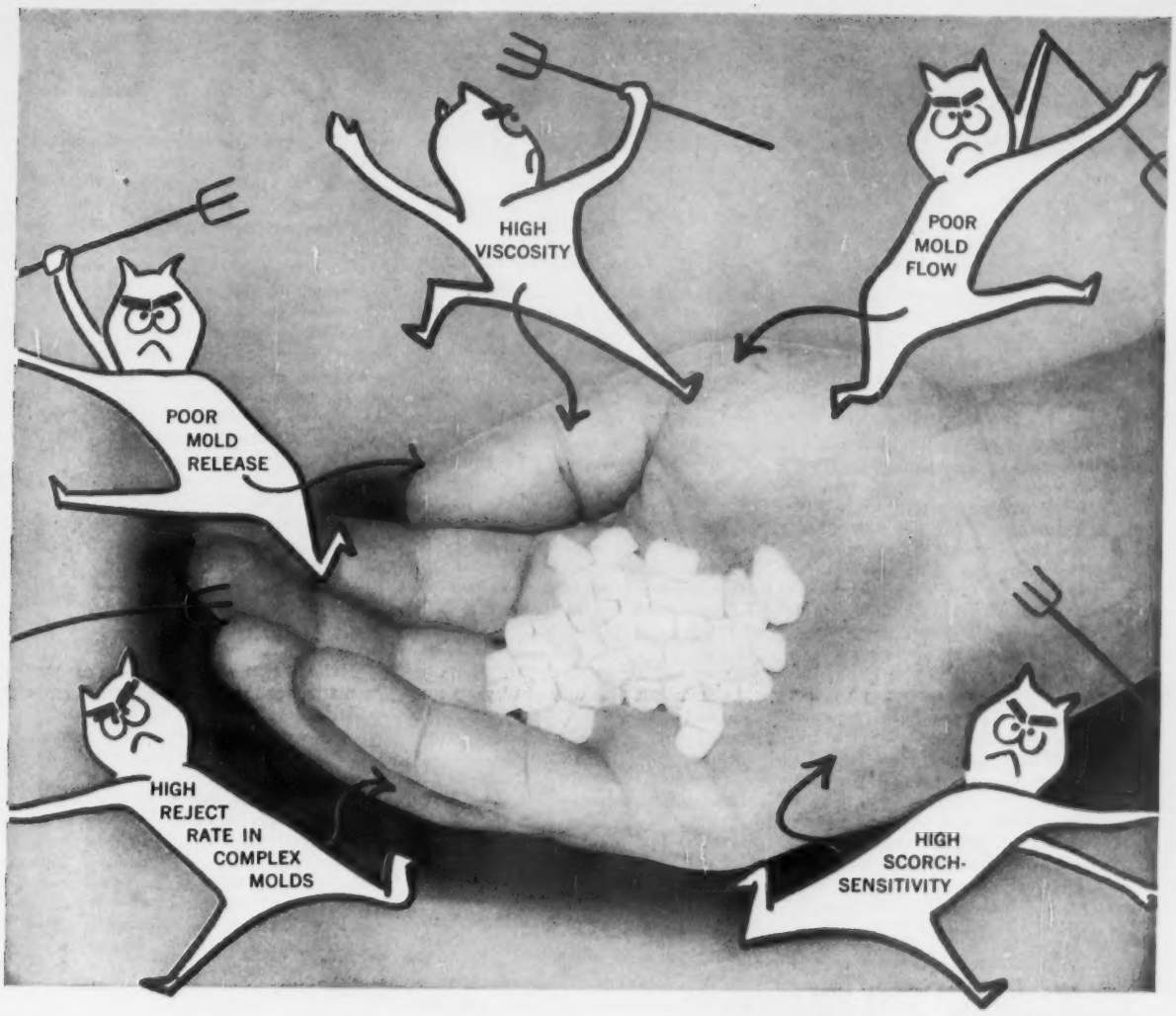
► DuPont of Canada (1956) Ltd. plans to construct a plant at Whitby, Ont., to produce polyethylene film and will also expand facilities at its Shawinigan, Que., plant for the production of the latest type of cellophane cellulose film, a polymer-coated film called "KST." The Whitby plant will produce polyethylene film in a sheet and tubing form for the packaging and construction industry and initially, will employ about 80 persons. At the same time, a new plant to manufacture linear polyethylene resins will be erected near Sarnia, Ont., at a site about five miles south of the city.

Kenneth J. Soule

Retires From Raybestos

► Kenneth J. Soule, manager of the Manhattan Laboratories, has retired after 40 years with the Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J. While with Manhattan, Mr. Soule did extensive work on transmission and conveyor belt development and helped to adapt new synthetics and other materials into its processes. He also helped to build the Manhattan Laboratories. Mr. Soule started with the company as a chemist in 1919 after serving with the Chemical Welfare Service during World War I. Previous to that, he had been with the Goodyear Laboratories at Akron, Ohio and Toronto, Canada. Mr. Soule was graduated from the University of Washington, Cum Laude, and is a member of Phi Beta Kappa and Phi Lambda Upsilon honorary chemical society. An active member of the American Chemical Society, he was chairman of its New York Rubber Group for one term.

► Cabot Carbon, Ltd., Toronto, Ont., has announced that L. B. MacQueen, formerly sales manager, has been appointed sales director and has been elected to the board, effective June 1958. A native of Scotland, Mr. MacQueen was educated at London University, receiving a B.S. degree in 1949. He joined Cabot in 1953 as chief chemist in charge of quality control and as assistant in technical service work. In 1955, he was appointed assistant to the sales director and was named sales manager in charge of all sales functions of Cabot Carbon, Ltd. in 1957.



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Most promising of all processing aids, "A-C" Polyethylene has proved to be more than just a lubricant.

It also modifies tack, markedly reduces shrinkage, improves dimensional stability and increases calendering or extruding rates. From 2 to 5 parts per hundred of rubber greatly improve processibility of most elastomers. For example, Mooney Viscosity was lowered in a typical black-filled butyl compound from 91 to 78 with addition of 5.0 parts of "A-C" Polyethylene.

Many rubber formulators are using "A-C" Polyethylene to achieve improved processibility . . . reduction in viscosity and scorch-sensitivity . . . better mold flow and release. This is a combination no other additive can match. The use of "A-C" Polyethylene results in substantial savings in labor costs and reduction of rejects, as well as facilitating the molding of highly loaded rubbers.

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Obituaries

Walter E. Lyon

► Walter E. Lyon, chief of tire engineering and development for the Firestone Tire and Rubber Co., Akron, Ohio, died in Akron General Hospital on October 4 after a long illness. He was 55 years old. Born in Walton, N. Y., Mr. Lyon joined Firestone as an engineering trainee after receiving a degree in mechanical engineering from Cornell University. He became manager of Firestone tire engineering in 1940 and ten years later, was named to head tire development. When engineering and development were combined in a single Firestone division in 1953, Mr. Lyon became its director. During World War II, he served on numerous government advisory boards and committees on the use of tires and also counseled the various military services on the development of new tires to meet the special purposes of each.

An international authority on tires of all types, Mr. Lyon's work took him over much of the world. He held a number of design and tire construction patents and up to the time of his last illness, he was a prolific producer of scientific and technical papers and articles. Also active in technical organizations, he was president of the Tire & Rim Association of the United States and in this capacity, led efforts to standardize tire and rim sizes. He belonged to the Society of Automotive Engineers, was a charter member of the United States Auto Club and was chairman of SAE's Akron Section at the time of his death. He is survived by his wife and two daughters.

Herbert A. Stanton

► Herbert A. Stanton, former president of the Behr-Manning Overseas Division of the Norton Co. of Worcester, Mass., died recently at his home at Harwichport, Mass. He was 71 years old. Mr. Stanton was vice-president of the Norton Company, makers of grinding wheels, sharpening stones, abrasive grain and other products, from 1947 until his retirement in 1952. When Behr-Manning was formed in 1951, he became its first president. He had begun his career with Norton as credit manager in 1912 and served as European manager, foreign manager and general manager of the foreign division. He also had been managing director of Norton Grinding Wheel Co. in England. At his retirement, Mr. Stanton was a director of each of Norton's foreign grinding wheel plants and president of the French and Italian plants. He is survived by his wife.

James R. Glazebrook

► James Robinson Glazebrook, an authority on brake linings and friction materials died on August 24 at his home in New York after a long illness. He was 51 years old. Mr. Glazebrook was manager of the industrial friction materials division of the Johns-Manville Corp. until he resigned recently to take a more active part in the operation of the Louisville Grocery Co., a wholesale concern founded in Kentucky by his grandfather. Before 1952, Mr. Glazebrook was chief engineer in the Johns-Manville friction materials division. He was consulted frequently by automobile racing drivers regarding brake linings for their cars. Mr. Glazebrook was born in Louisville, Ky., and received a B.S. degree and an M.A. degree from the Massachusetts Institute of Technology. He belonged to the Society of Automotive Engineers and had been an early member of the American Rocket Society. He is survived by his wife, a son and two daughters.

Marvin O. Shrader

► Dr. Marvin O. Shrader, supervisor of organic chemicals research in the Research and Development Department of Pittsburgh Coke & Chemical Co., died on September 21. He was 45 years old. He joined the company in 1952 and had previously been associated with the General Aniline & Film Corp. Dr. Shrader had been awarded numerous U.S. and foreign patents in the field of industrial chemistry. Born in Bishop, Va., Dr. Shrader received an A.B. degree from Berea College, an M.A. from Syracuse University and a Ph.D. from Yale University. He was a member of the American Institute of Chemists, the American Chemical Society, Alpha Chi Sigma, Sigma Xi, the American Association of Textile Chemists and Colorists, and the New York Academy of Science. He was active in civic affairs in and around Pittsburgh. Dr. Shrader is survived by his wife, a son and a daughter.

Leon Emmons

► Leon Emmons, retired purchasing agent of Thomas A. Edison Industries, died of a heart attack on August 27 at his home in Orange, N. J. He was 70 years old. Mr. Emmons, who had been employed by Edison for more than forty years, retired in 1956. He was active in church and civic affairs in Orange and was a past president of the Executives Club of Orange. He is survived by his wife, two sons and a daughter.

Phillip H. Goldsmith

► Phillip H. Goldsmith, board chairman of MacGregor Sports Products, Inc., died of a heart attack on September 18 in Munich, Germany. He was 61 years old. Mr. Goldsmith entered the sporting-goods field in 1916 with P. Goldsmith Sons. He was president of MacGregor before being named chairman of the board in 1956. Last February he was elected to the Sporting Goods Hall of Fame of the National Sporting Goods Association. He had served five terms as president of the association. Mr. Goldsmith was a veteran of World War I. In the Nineteen Thirties he served with the Compliance Committee in the National Recovery Administration and, during World War II, with the Industry Committee of the War Production Board. He is survived by his wife and a daughter.

Julian S. Pruitt

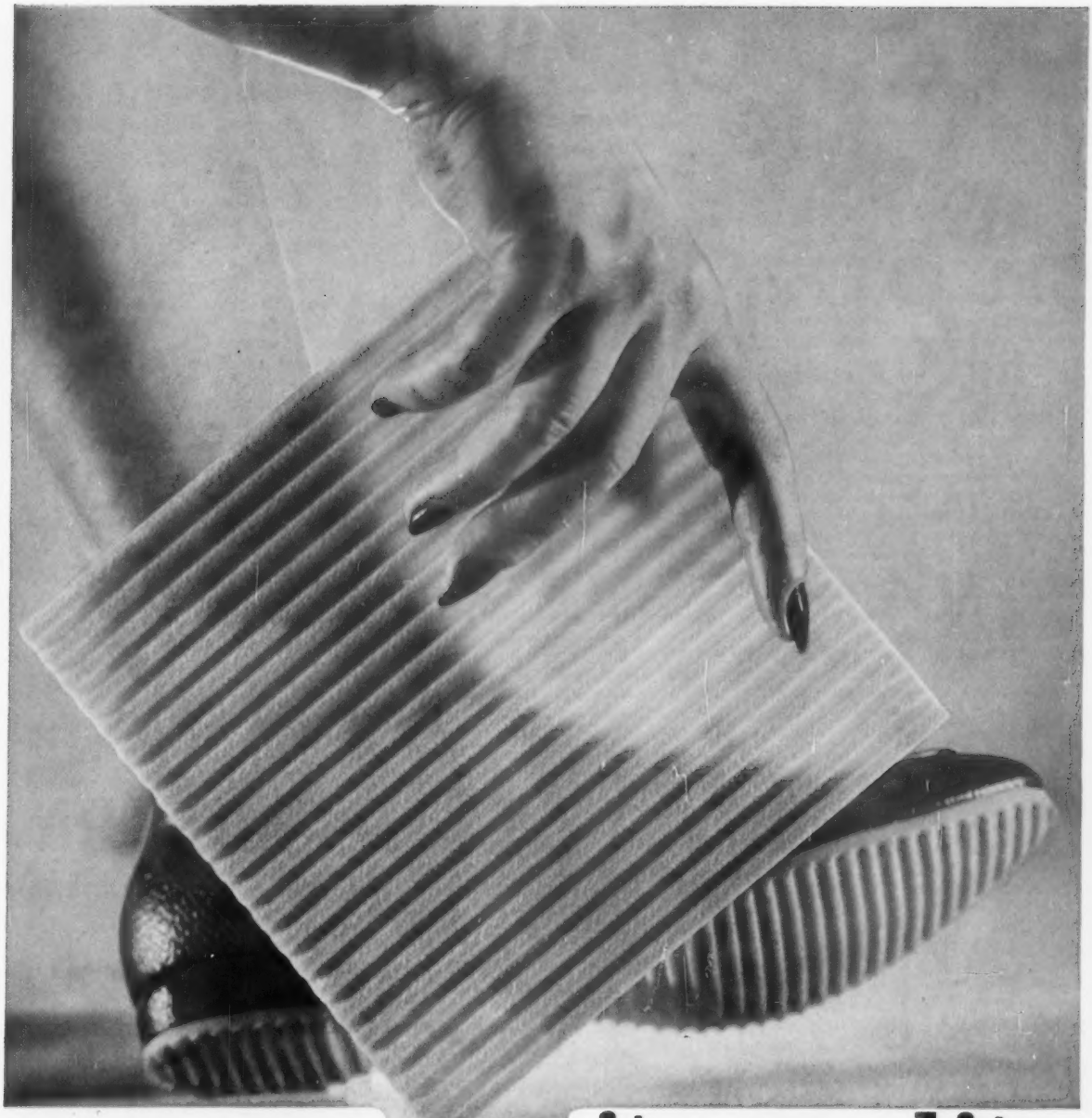
► Julian S. Pruitt, chemical sales representative for the Plastics & Coal Chemicals Division of Allied Chemical Corp., died on August 28. He was 33 years old. Mr. Pruitt had represented the Division in the Cleveland area since 1957. Prior to that time, he was chemical sales representative in the Detroit and New Jersey areas. He was a member of the Chemical Salesmen's Club of Cleveland and the American Society of Chemical Engineers and was active in local paint, rubber and plastics trade associations. Mr. Pruitt was a graduate of South Carolina State College. He is survived by his wife and a daughter.

Hervey S. Walker

► Hervey S. Walker, chairman of Walker Brothers, manufacturers of electrical construction materials, died on September 14 in Atlantic City Hospital, New Jersey. He was 78 years old. Mr. Walker had been associated in the old Walker Electric Co., manufacturers of telephone switchboards. He was a member of the Union League, the Merion Cricket Club, The Midday Club and the Electric Association of Philadelphia. He is survived by his wife, a son and a daughter.

Charles D. Allen

► Charles D. Allen, retired vice-president of H. Kohnstamm & Co., Inc., chemical manufacturers, died on September 7 at his summer home in Sagamore Beach, Mass. He was 79 years old. Mr. Allen, who had been with the company for fifty years, retired in 1954. He was a member of the American Institute of Chemical Engineers. He is survived by his wife, a son and two daughters.



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We now have two types of resins available. These are standard types. Poly-Phen S-201 is designed for use with general purpose, synthetic rubber and natural rubber. The other, Poly-Phen S-202, has application in the compounding of nitrile rubbers. The uncatalyzed resin is available in powder and flake form. Both S-201 and S-202 are also supplied admixed with catalyst. Technical literature and samples of these resins are now ready.

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Bellanca Names New Board

► Bellanca Corp., Akron, Ohio, has named a new seven-man board of directors and new officers to replace the previous four-man board which recently resigned. The new officers named at a directors' meeting in Washington include *Chairman*, C. C. Jerden, president of Jerden Manufacturing Corp.; *President*, Rear Adm. William R. Brockman (Ret.), once associated with Olin Mathieson Chemical Corp.; *Secretary*, H. McCoy Jones, a director of Beryllium Corp.; and *Treasurer*, Vice Adm. Edward C. Ewen (Ret.), a vice-president of Fram Corp. Other new directors are A. Ray Smith, president of Standard Industries; William O'Connell, Chicago public relations consultant; and Dr. Dillon Geiger, physician, businessman and a trustee of Indiana University.

The new board, which has called a special stockholders' meeting for September 16, said it wants to restore Bellanca's stock to trading on the American Stock Exchange. The company's stock was ordered delisted from the American Exchange on June 2 by the Securities and Exchange Commission for filing "false, misleading and inadequate" financial reports. The stock had been suspended from trading for more than a year while the S.E.C. investigated the company's affairs.

Acquires Magnetizing License

► Under terms of a license agreement negotiated with Max Baermann, West Cologne, Germany, a new flexible permanent magnetic material has been added to the list of industrial manufacturing products of the General Tire & Rubber Co., Akron, Ohio. Company officials said this new and ingenious product has unlimited applications in the industrial, commercial and household manufacturing fields. They said that for many uses it has outstanding characteristics of economy, efficiency and safety. Special magnetizing equipment has already been installed by General's Industrial Products Division, which operates three manufacturing plants from headquarters in Wabash, Ind.

Shoe Products Prices Raised

► Price increases ranging from two to five per cent, which are due to actual cost increases, have been announced by the Shoe Products Division of Goodyear Tire & Rubber Co., Akron, Ohio. Company officials said that several wage increases have been made since the last price increase for the shoe repair trade. The failure of labor productivity to keep pace with the rising wages was cited as forcing the company to increase its prices following the recent industry-wide eight-cent hourly wage boost.

F-B Corrects Misunderstanding

► The sale of Waterbury Farrel Foundry & Machine Co. to Textron, Inc., a short time ago, has given rise to a misunderstanding that the concern involved is Farrel-Birmingham Co., Inc., Ansonia, Conn. Farrel-Birmingham officials have declared that there is no corporate relationship between the two companies, nor has there been since 1880. Farrel-Birmingham is an independent manufacturer of heavy machinery and will continue to serve the many industries that it has in the past.

Season Activities Announced

► The Washington Rubber Group begins its second decade of operations this fall with five meetings scheduled for the 1958-59 season. The kickoff meeting of the group has been planned for October 20 with a dinner-dance to be held at the Touchdown Club in Washington, D. C. A field trip on November 3 to the Western Electric Wire & Cable plant in Baltimore, Md., has been arranged by program chairman Thomas A. Tharp. This innovation in WRG activities will feature a talk by Irvin Kolman on the "Operations of a Small Rubber Company" following a dinner hosted by Western Electric. On February 2, the group will assemble at the Army-Navy Club in Washington where Brig. Gen. Richard Hayward, USMC (ret.), will give a talk on "The New Defense Department," what it looks like organizationally and how it functions since the military reorganization act passed in Congress last summer. No details have been announced for the final two meetings of the season that are scheduled for April 6 and May 4.

Shell Development Appointments

► Dr. N. R. Legge and Dr. R. J. Reynolds have been appointed to assistant department head and research supervisor, respectively, for the Polymer and Chemical Applications Department of Shell Development Co., Emeryville, Calif. Dr. Legge will assist in general department management and continue to direct the firm's synthetic rubber research. He holds a degree in chemistry from the University of Alberta and received his Ph.D. in chemistry from McGill University in 1945. Dr. Reynolds has been named to supervise a group engaged in elastomer evaluation research. He received his A.B. and Ph.D. degrees from the University of Utah. Both men came to the company's Emeryville Research Center three years ago.

Spanish Plastics Fair Planned

► The Department of Plastics of the Patronage "Juan de la Cieva" of Technical Investigations, Madrid, Spain, has announced that the Second Fair and Exhibit of Plastics will take place from November 14 to 23, 1958, in Madrid. The Fair will coincide with the Golden Anniversary of the Spanish Association for the Progress of Science, and with the 24th Spanish-Portuguese Congress of that association. The conventions are sponsored for the exchange of ideas among Spanish technicians and manufacturers through lectures, demonstrations and discussions held at the meetings. Displays at the Exhibit of Plastics will point out the latest progress made in manufacturing processes by this nationalized Spanish industry. An exhibit of plastics manufacturing, to be displayed at the Fair, will take the viewer on a step by step basis from the raw material to the finished product. Another exhibit will show how the plastics are properly used. A commercial exhibit will display plastics appliances and devices ranging from simple domestic gadgets to complicated industrial plastic making machines. Further information on the Fair and Exhibit of Plastics can be obtained from the Department of Plastics, Serrano, 119, Madrid, Spain.

Purchasing Workshop Scheduled

► Purchasing Agents Association of Chicago, affiliated with the National Association of Purchasing Agents, will hold its two day "Purchasing Workshop" on October 21-22 at the Illinois Institute of Technology, Chicago, Ill., to help solve important problems confronting all purchasing personnel today. The sessions will be in small groups covering Inventory Control, Value Analysis, Measuring Purchasing Performance, Internal Department Relationship, Vendor Relations and Sources, Legal Aspects of Purchasing, Purchasing Procedure and Organization, and Data Processing. Paul Farrell, managing editor of *Purchasing*, will speak on "Signs of the Times," and Henry E. Seyfarth, one of the pioneers of the St. Lawrence Seaway, will speak on that subject. Registration fee for members of the National Association of Purchasing Agents is $35.00, while for nonmembers the fee is $50.00.

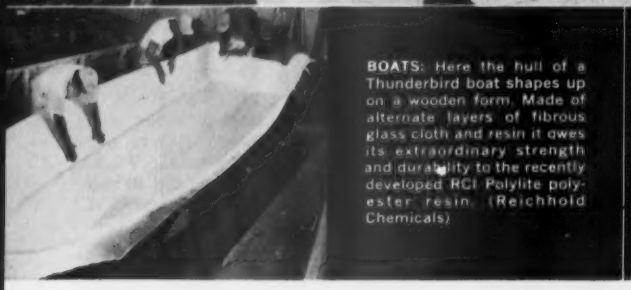
Marbon Opens New Center

► The General Sales Office, Research Laboratories, and General Administrative Departments of Marbon Chemical Co., are now located in a new administrative center that was constructed as a part of the new Woodmar Plant at Washington, West Va. The new address is Box 68, Washington, West Va., and the new telephone number is Garfield 2-5401.

ADHESIVES → NEW MARKET

INSULATION: Workman applying black adhesive, EC-321, to surface of an air conditioning duct, which must be insulated for complete efficiency. EC-321 can be applied to dry metal or to duct surfaces on which there is condensed moisture, and still hold.

(Minnesota Mining and Manufacturing Company)



BOATS: Here the hull of a Thunderbird boat shapes up on a wooden form. Made of alternate layers of fibrous glass cloth and resin it owes its extraordinary strength and durability to the recently developed RCI Polylite polyester resin. (Reichhold Chemicals)

METAL BONDING: This huge concrete wheel ultimately will be used in the grinding of cocoa beans. Here a workman applies Bondmaster to bond steel shaft to wheel. This epoxy resists corrosive action of cocoa oil. (Rubber and Asbestos Corporation)

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There's one common denominator that's an essential in a remarkably varied number of industries. That essential is adhesives. Adhesives are used not only in boats, metal bonding and insulation—but in such widely diverse products as aircraft and jewelry, radios and paper bags, luggage and household appliances.

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Mills Shepard research has begun to define clearly the enormous scope of this new market—a market that's "packaged" for the first time by a publication that concentrates its entire circulation wherever adhesives are made and used. Among manufacturers of all kinds and types of adhesives. Among companies who use adhesives in their own production and packaging. Among companies who buy and re-sell adhesives in conjunction with their products . . . and among suppliers of all goods, services, machinery and equipment for the production and shipment of adhesives.

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ADHESIVES AGE NEW MAGAZINE

Rubber Division Library Changes Service Policy

► The Library Committee of the Division of Rubber Chemistry at the University of Akron, Akron, Ohio, has announced that, effective November 1, members of the Division will be charged $2.50 for bibliographies and non-members will be charged $5. Formerly, bibliographies were supplied without charge, as are other services of the Library.

Increasing demand for the bibliographies made the change in policy mandatory. The Library will continue to provide its other services free of charge. The Rubber Library lends books or journals through local libraries and answers reference questions on subjects related to rubber. At present, it is also helping Division members by proof-reading *Rubber Chemistry and Technology*.

Requests for bibliographies should be addressed to Mrs. Lilian Cook, Rubber Division Library, University of Akron, Akron 4, Ohio. Those currently available are:

(1) *Rubber Linings.* March 1952. 48 references.

(2) *Mastication of GR-S.* March 1952. 91 references.

(3) *The Uses of Rubber in Agriculture.* April 1952. 34 references.

(4) *Drying of Adhesive-Coated Fabrics.* April 1952. 17 references.

(5) *Tire Design and Manufacturing,* 1941-1951. April 1952. 140 references.

(6) *The Processing of GR-S Involving the use of Plasticizers.* May 1952. 35 references.

(7) *The Use of Lignin in Rubber and Synthetic Rubbers,* 1945-May 1952. May 1952. 20 references.

(8) *Diaphragms. Part I. Rubber and Elastomer Materials.* 12 references. *Part II. Metal Materials.* 10 references. May 1952.

(9) *The Tensile Strengths of Natural and Synthetic Rubbers.* June 1952. 22 references.

(10) *The Use of Synthetic Resins in Natural and Synthetic Rubbers.* June 1952. 52 references.

(11) *The Determination of Ozone in Air.* August 1952. 41 references.

(12) *The Diffusion of Gases Through Natural Rubber and Butyl Rubber.* October 1952. 21 references.

(13) *Mills and Calendars. Part I. Operation.* 8 references. *Part II. Safety Factors.* 15 references. November 1952.

(14) *Compounding of Gutta-Percha and Balata Resins.* November 1952. 4 references.

(15) *Behavior of Gutta-Percha and Balata Toward Oxygen and Oxidation.* November 1952. 4 references.

(16) *The Tear Strengths of Natural and Synthetic Rubbers.* February 1953. 56 references.

(17) *Abrasion Testing of Natural and Synthetic Rubbers.* June 1954. 160 references.

(18) *Rubber to Metal Bonding (Excluding Brass Bonding).* December 1955. 135 references.

(19) *Glove Dipping Techniques.* May 1955. 27 references.

(20) *Reclaim Rubber Cements.* December 1955. 19 references.

(21) *Permeability of Elastomers to Water and Water Vapor.* December 1955. 50 references.

(22) *The Permeability of Elastomers to Oxygen.* December 1955. 20 references.

(23) *Permeability of Elastomers to Air.* December 1955. 10 references.

(24) *Rubber Bearings.* November 1955. 20 references.

(25) *Isocyanate - Polyester Compounds.* June 1955. 117 references.

(26) *Continuous Vulcanization of Extrusions for Wire and Cable.* July 1956. 44 references.

(27) *Finishing of Small Molded Goods.* August 1956. 16 references.

(28) *Oil-Extended Rubbers.* April 1957. 117 references.

Named Research Director

► James M. Rice has been appointed to the position of laboratory director of the National Rubber Bureau, 1631 K Street, N.W., Washington, D. C. Mr. Rice was formerly research and testing engineer for the National Crushed Stone Association and is widely known in the highway research field. A registered Professional Engineer, he took his Master's degree in highway engineering from Purdue University where he also taught. Mr. Rice has published a number of technical papers and in 1953 received the Asphalt Paving Technologists Annual Award for his paper, "Volumetric Methods for Measuring Asphalt Content and Effective Gravity of Aggregates in Bituminous Mixtures." He is on the board of directors of the Association of Asphalt Paving Technologists, and is a member of various committees for the Highway Research Board and the A.S.T.M.

James M. Rice

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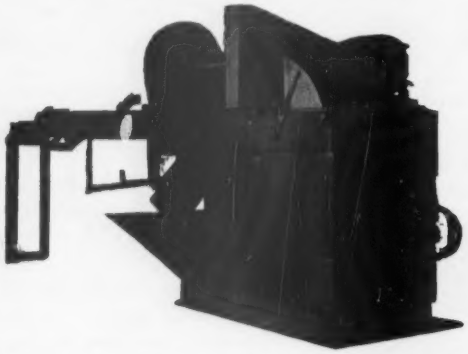

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New Goods

Butyl Rubber Roof Coating

► A butyl rubber emulsion that acts as a raincoat for roofs has been introduced by Montgomery Ward & Co., Chicago, Ill. The new product was developed for Ward by Silicon Chemical Corp. in order to provide a more economical and faster means of reroofing a house. A leakproof

film of liquid rubber is applied by brush or roll which dries and vulcanizes itself to the roof in about four hours. The new roof coating is guaranteed by Ward to prolong the life of an old roof up to 15 years, and is available in shades of red, green, brown and silver grey.

Quartermaster Industrial Glove

► A new type of glove, designed to conform to the hand in its normally relaxed "ready-to-work" position, has been developed for use of guided missile fuel handlers and in industrial applications where special protective handwear is required by the U.S. Army Quartermaster Research and Engineering Command. The new gloves are made of supported vinyl and are manufactured by a dipping process. The dipping forms were evolved after study of comprehensive data by scientists and technologists at the Army's Natick, Mass., headquarters. The gloves have been subjected to fitting and sizing studies through the cooperation of approximately 300 soldier test subjects at Ft. Lee, Va. The field studies proved that the new gloves are greatly superior to the conventional type in their fitting characteristics, and provide increased comfort and a high degree of manual dexterity. Constructed in four sizes, the gloves are said to fit any hand.

Camouflaged Hunting Parka

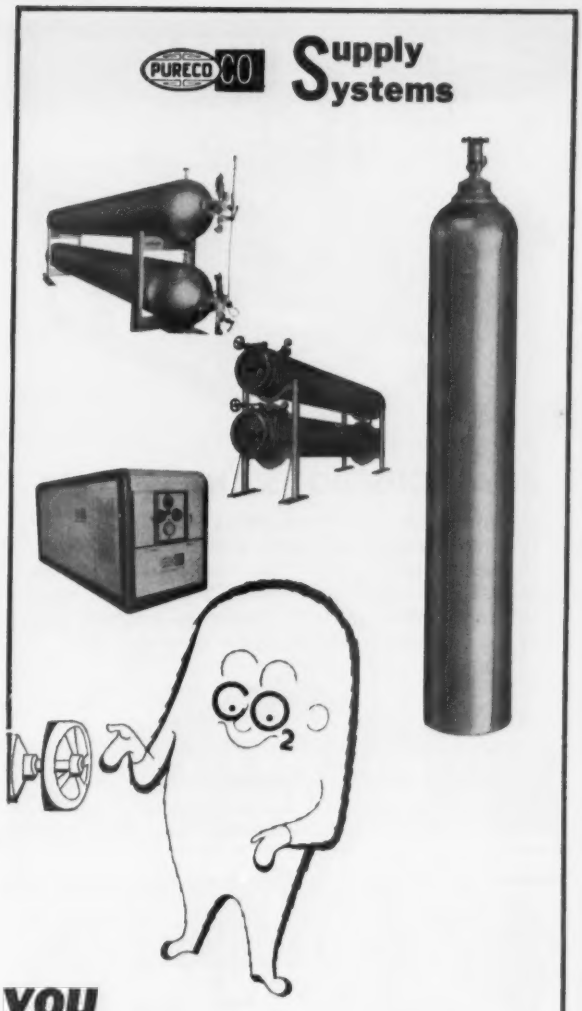
► A new camouflaged hunting parka, which blends the wearer into backgrounds of grass, reeds and brush, has been introduced for sporting enthusiasts by Hodgman Rubber Co., Framingham, Mass. Material used in manufacture of the garment consists of a waterproof layer of "Plioflex" between two layers of durable fabric. The parka is said to be extremely flexible and exhibits excellent aging characteristics, exceptional waterproofing and weathering qualities. Camouflage effect is achieved by printing patterns in various shades of brown on a light brown dyed sheeting, each shade requiring a separate printing run. The parka features two deep, roomy shell pockets, and a flannel lined hood which fits closely around the face and neck. The hunting garment is 40-inches long, is made in five sizes, and weighs less than three pounds. Extra material in the shoulders and full raglan sleeves permit complete freedom of movement. All seams are waterproof and the zipper-neck opening is reinforced with a V-shaped gusset for added protection.

Hammock-Style Belt Conveyor

► Hewitt-Robins, Inc., Stamford, Conn., has developed a new type of belt conveyor featuring a hammock-style idler suspended on wire ropes. According to the company, the belt conveyor can be erected and taken down faster than a conventional conveyor, operates with less spillage of material, prolongs belt life, and provides smoother, more economical operation. The belt conveyor consists of prefabricated steel stands held in alignment by parallel ⅝-inch wire ropes on either side of the stands. The wire ropes may also be suspended from the roof of a mine by means of special suspension frames anchored with roof bolts, allowing free passage of shuttle cars, service trucks and other mining equipment. The hammock frames not only support the idler rolls but also serve as spreaders to keep the wire ropes in their proper lateral position. Ruggedly built yet relatively light in weight, the idler assembly for a 36-inch belt weighs 46 pounds.

Junior Horseshoe Set

► A junior-size horseshoe set, consisting of four shoes and two bases with rounded-top pegs, has been added to the toy line made by the Barr Rubber Products Co., Sandusky, Ohio. Company officials said the set is suitable for indoor or outdoor use and is safe for very small children, aiding in development of coordination. Instructions for playing and scoring are imprinted on the box and all pieces are washable and unbreakable.



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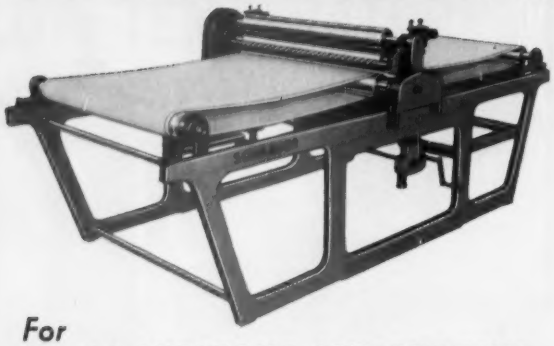

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Foamedge Vibration Dampeners

► Seals and vibration dampeners made from "Foamedge", a polyurethane foam encased in vinyl tubing, are being manufactured for various industrial uses by the Sterling Alderfer Co., Akron, Ohio. Foamedge is soft and flexible, compressing to a small fraction of its diameter but with full recovery when released, and combines the features of heat insulation and shock absorption. The company said the new product can be adapted to numerous uses in air conditioning, refrigeration, sound proofing and light sealing. Industrial Foamedge is self adhesive and sticks to clean metal, wood, glass and most plastics. It is available in reels, or strips cut to length and mounted on cards to facilitate fast handling in production work. Foamedge is made in any length with ¼- to ¾-inch diameters. The foam is made in black or white, the vinyl casing, white or gray.

Lawn Mower Grass Catchers

► Large vacuum-formed plastic containers that are used as grass catchers on reel and rotary power lawn mowers have been developed by the Jacobsen Manufacturing Co., Racine, Wisc. The grass catcher, molded from Naugatuck Chemical "Kralastic", is being manufactured in two styles. An open on one side model replaces old style grass catchers and is front-mounted on Jacobsen reel type mowers which throw cut grass forward. The other, part of the Jacobsen "Turbo-vac Rotary" mower, fastens to an ejection chute at the rear of the mower housing and catches grass clippings propelled by the suction lift rotor. Jacobsen said the grass catcher was tested in temperatures ranging from —10 to +100°F. and in impact tests where small objects were projected at the molded plastic sections at speeds ranging up to 200 miles per hour.

Truck Unloading Fuel Hose

► A new hose with increased flow capacity that speeds the unloading of fuel from trucks into home storage tanks has been developed by Hewitt-Robins, Inc., Stamford, Conn. The new hose, with a 1⅜-inch inside diameter, is said to increase the flow rate by 20 per cent without adding any weight to the hose. The high-tenacity rayon cord reinforced hose wall is thinner than the older models, yet will withstand working pressure of 150 psi. Company officials said the thinner wall reduces the overall weight of the hose, making it easier to handle. An improved cover design extends service life and provides protection from abrasion, sun, weathering and chemical action.

Aviation Refueling Hose

► An all-synthetic ground refueling hose, capable of conveying all types of aviation fuels and designed to meet rigid government specifications, has been developed by Quaker Rubber Division, H. K. Porter Co., Philadelphia, Penna. The tube is made with nitrile as the basic polymer, compounded to prevent swelling or loss of adhesion to the carcass. After compounding, the material is extruded to produce a continuous, seamless tube of maximum flexibility, suitable for service at temperatures from −65 to +130°F. Seamless circular woven dacron warp and filler reinforcement offer maximum burst strength with a minimum of weight. The new refueling hose was tested under actual operating conditions for several months to determine its serviceability. The company said that more than one million gallons of aviation fuel were pumped through the hose without signs of failure or excessive wear. Prior to shipment, the hose is hydrostatically tested with aviation fuel to eliminate possible contamination under actual operating conditions. Hose ends are protected by screw caps on the couplings to prevent accumulation of foreign material during shipment or storage.

Pile Driving Hose

► Republic Rubber Division of Lee Rubber & Tire Corp., Youngstown, Ohio, has developed a new "Pile Driver Hose" construction that gives strong adhesion of tube to reinforcements by a combination of asbestos, wire braid and tube. The pulsating service of pile driving puts a premium on adhesion since the intermittent pressures keep forcing the tube away from reinforcements until finally the tube tears loose. Republic's Pile Driver Hose is a new type of construction that offers strong adhesion without sacrificing flexibility and strength. Already in use, the company said the new hose has proved itself in the field as well as laboratory test chambers. It is available in 1½- and 2-inch sizes.

Rubbermaid Kar License Kover

► A one-piece, snap-on, all plastic cover, sized to fit over standard license plates has been introduced by Rubbermaid Inc., Wooster, Ohio. Called "Kar License Kover", it is made from butyrate, a non-yellowing, flexible, shockproof and corrosion resistant clear plastic. Company officials said the Kar License Kover offers positive, functional protection to resist road salt and cinders, rain, snow, ice, dust, oil and bumps from stones. Requiring only finger pressure to be snapped into place, it is available with a clear, or colored border of silver or gold.

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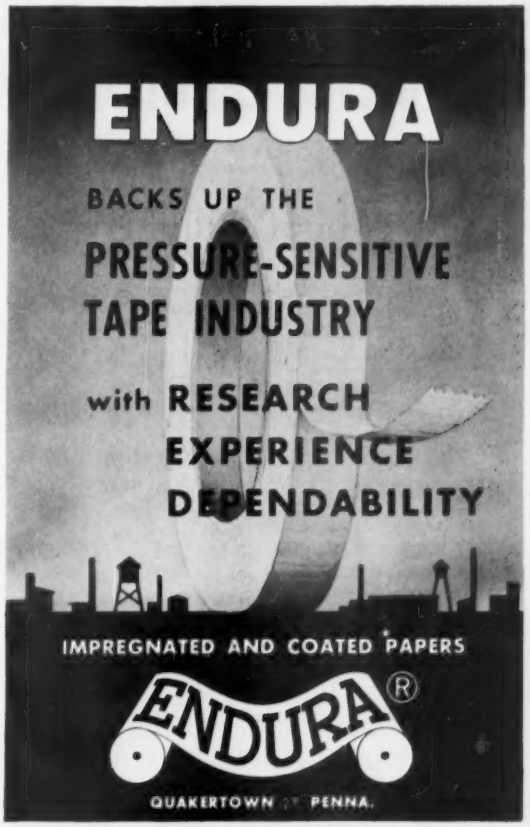

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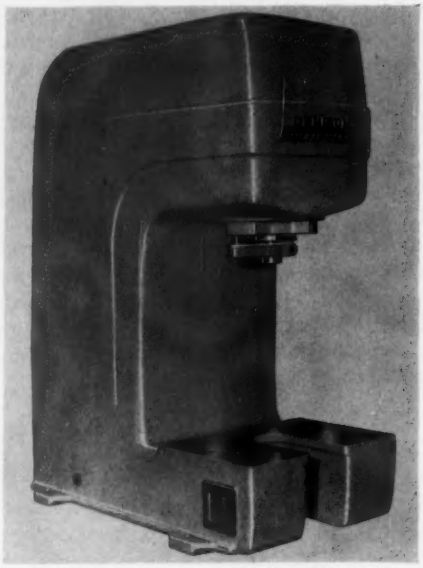
New Equipment

Denison Two-Ton Multipress

► A two-ton "Multipress," designed to simplify production operations, has been developed by Denison Engineering Division, American Brake Shoe Co., Columbus, Ohio. The new press is said to be capable of improving production efficiency on operations such as pelleting, compacting, trimming, testing, marking and others calling for accurately controlled ram pressure. Advantages provided by the hydraulic press include accurate duplication of pressure on each ram stroke, precision ram alignment with the work, faster cycle time than possible on the conventional small press, fast set-up, ample daylight to adapt a wide range of tooling, and interlocked manual and electrical controls to avoid accidental tripping of ram. Completely self-contained for easy installation, the press operates on 110 volt, 60 or 50 cycle single phase circuit, or can be wired for operation on 220 volts. The hydraulic unit is a single power unit that can be removed and replaced in a few minutes. Ram pressures, infinitely variable, range from 1000 to 4000 pounds. Designed for manual or automatic production, the press can be tooled with dial tables, power screw feed hoppers, stock feeds and similar accessories. It can be wheeled about on a light roll-around table, and thus can be utilized as permanent production tooling, brought from the tool supply with tooling intact as manufacturing schedules dictate. Being electrically controlled, the Multipress is easily adapted to automation, which reduces initial tooling and equipment costs.



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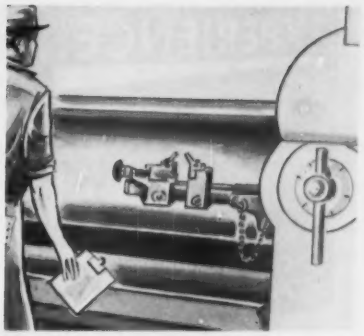

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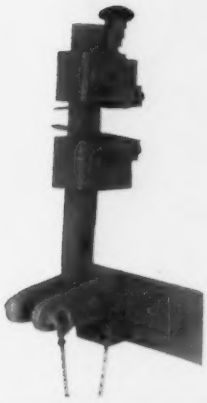
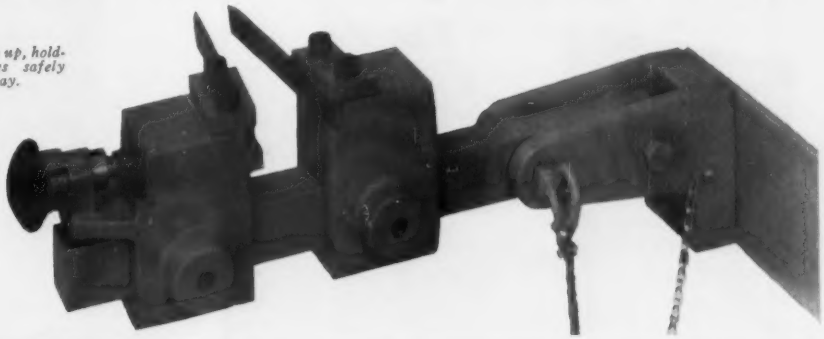


Unit folds up, holding blades safely out of way.



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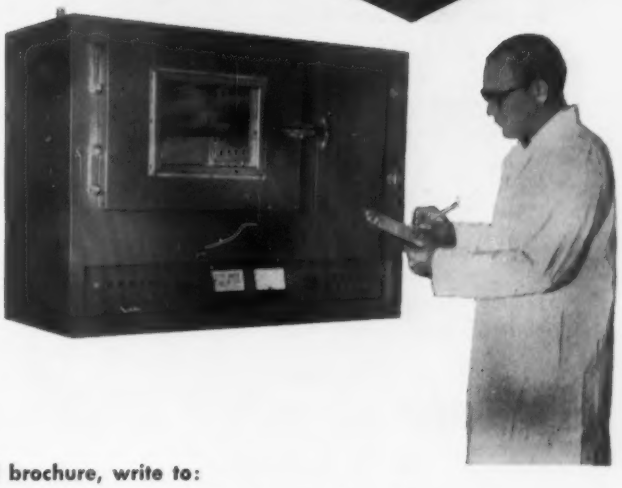

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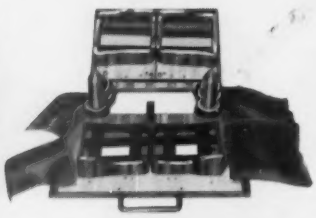

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Alnor Indicating-Controlling Pyrometer

► The Alnor Pyrotroller, a product of Illinois Testing Laboratories, Inc., 420 North LaSalle Street, Chicago 10, Illinois, is a pyrometer controller, an instrument which can be applied wherever a thermocouple can be used to measure temperature. The manufacturer states that the instrument has proven itself highly dependable because a minimum of components are involved in its design. Compact size requiring a minimum of panel space provides a further advantage should installation in hazardous locations be required. The on-off control featured in the instrument is available in either single or double target version. Accuracy is said to be within 1% of full scale as a millivoltmeter. The model shown in the illustration is the flush mounting case style, but other styles are available. This "on-off" control is available in both single and double target versions.

Bronwill Multipurpose Homogenizer-Disperser

► The Willems Polytron multipurpose homogenizer-disperser, manufactured by Bronwill Division, Will Corp., P. O. Box 127, Brighton Station, Rochester 10, N. Y., is a high frequency wet-milling and mixing device. Recommended uses include mixing, dispersing, homogenizing, emulsifying, defibration, extraction and chemical reaction acceleration. The design of the milling head features a precision ring-within-ring combination of shearing heads. The inner ring, rotating at high speeds, provides a strong pumping action that circulates the material being processed. Shear, impact, cavitation and pressure changes that further reduce particles in size also take place. Diverse and effective action is said to be provided by the combination of ring sizes, numbers of cutting edges, clearances between rings and peripheral speed of the rotor.

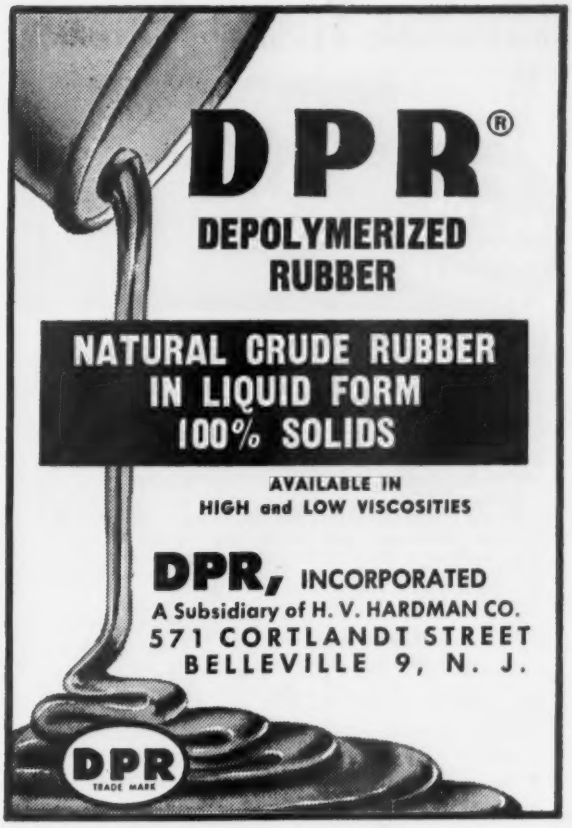
Kirk & Blum Industrial Ovens

► Industrial ovens, designated Type 110 and Type 40, designed for drying, baking and curing applications, are now available from Kirk & Blum Manufacturing Co., 3100 Forrer St., Cincinnati 9, Ohio. The ovens feature built-in recirculating air

passages and equipment designed to assure increased efficiency and uniformity of temperature throughout. An operating temperature range of 200 to 600°F. is provided by a pressure-mixing type, direct fired gas burner. Electrical, oil or steam-heating equipment is also available. The burner, as well as the recirculating fan, are enclosed and insulated to conserve heat. The multi-blade recirculating fan has external bearings. The ovens are designed with a completely unobstructed interior and wide-opening doors for efficient use with racks or trucks. Type 110 is 11 feet 2 inches wide, 10 feet 8 inches high and 9 feet 8 inches deep; Type 40 is 5 feet 8 inches wide, 9 feet 4 inches high and 7 feet 2 inches deep. Construction is of 4-inch thick insulated panels of 20-gauge steel with rounded corners.

Allis-Chalmers Adjustable Pump

► The ACAP pump for handling liquids or hygroscopic solids in suspension under variable capacity and head requirements is produced by Allis-Chalmers Manufacturing Co., Milwaukee, Wisc. The pump's precision variable flow control is handled by a manually or automatically operated adjustable internal bypass mechanism which eliminates the need for a valve controlled discharge where solids can build up an obstruction. The pump is available in capacities to 45,000 gpm.



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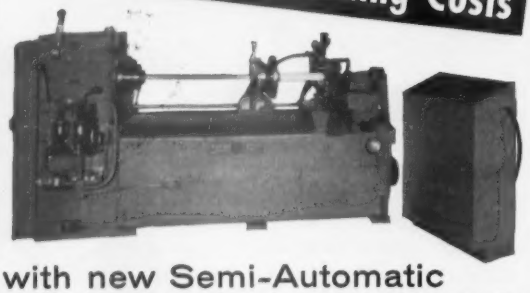

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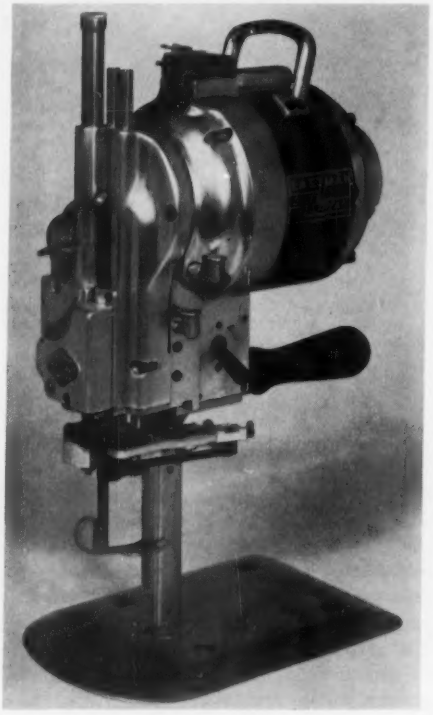
Eastman Knife-Saver Cutting Machine

► Eastman Machine Co., 779 Washington St., Buffalo 3, N. Y., has announced a new Knife-Saver series of automatic belt-sharpened straight knife cloth cutting machines built around an exclusive patented abrasive-belt sharpening principle.



The machines are said to decrease knife consumption by approximately 35% because they remove less metal from the blade-edge with each sharpening and also sharpen the blade further back before the knife has to be replaced. The new model is said to assure a dead-straight knife edge on regular knives from top to the point throughout the life of the blade; wave-edge knives are sharpened equally well. The Knife-Saver also features permanently lubricated motor bearings, a longer lasting sharpener driver, an adjustment to compensate for sharpener-driver wear and an instant-action pressure foot rod release.

► Richardson Scale Co., Clifton, N. J., has announced a new inexpensive **gross bagging scale** which features an eye-level visual balance indicator which enables on-the-spot elimination of weighing errors.

► Simpson Electric Co., 5200 West Kinzie St., Chicago, Ill., has added **elapsed time indicators** to its line of panel instruments. They contain auto-resetting counters.

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French Rubber Institute

translated by
IRENE E. BERCK, Ph.D.
Editor, Chemical Publishing Co., Inc.

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This is the first book ever published which thoroughly covers the entire rubber industry, including synthetic elastomers, latices of both natural and synthetic rubbers, and even the pertinent plastics, in less than 500 pages.

It is written especially for the busy rubber chemist and technologist, beginner and student, who have no time to untangle the details they really need from a maze of compiled literature.

Utility is the keynote of the book. With judicious selection from the latest developments in rubber chemistry and physics, theories of elasticity, vulcanization, accelerators, reinforcement, antioxidants, etc., and the most up-to-date procedures of rubber technology and testing, it provides a well-balanced, concise but comprehensive treatise on this vital commodity.

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Reviews

Fundamentals of High Polymers. By O. A. Battista. Published by Reinhold Publishing Corp., 430 Park Avenue, New York 22, N. Y. 6¼ x 9¼ in. 140 pp. $5.50.

This book has been written to serve as an introductory textbook for courses on high polymers at the undergraduate level. For that reason a broad spectrum of high polymer technology is covered, providing a bird's-eye view of the field, but the relation of high polymers to industry is also discussed in regard to commercially important applications. To meet the needs of the beginner in the field, a generous supply of schematic diagrams has been included.

The first chapter of the book is devoted to the best definitions available for key terms of high polymer science. The author felt this chapter particularly necessary because of the ambiguity and confusion which currently exists as to the exact meanings of certain terms used in the field.

The book is divided into two parts. Part I, "Basic Principles of High Polymers," has in addition to the chapter on basic definitions one other on the chemistry of high polymers. Part II, "Formation of Products from Macromolecules," is comprised of the following chapters: "The Building Blocks of High Polymers," "Macromolecules in Solution," "The Solid State of High Polymers," "Physical Properties of High Polymers," and "The Future of High Polymers." The book closes with a bibliography and subject index.

The bibliography, which lists 89 references, is divided into lists of various subjects, with the appropriate references under each heading. The groupings are: Adhesives, Biochemistry, Cellulose, Chemistry, Copolymerization, Fibers, Physical Properties, Physics, Plastics, Polyamides, Polyethylene, Polymerization, Proteins, Resins, Rubbers, Silicones and General High Polymer Textbooks. Eight of the references pertain to rubber.

Besides its function as a basic textbook, this volume will serve as a handy reference for chemists, engineers and others interested in academic or industrial research on high polymer technology. Others in non-technical capacities may also find the book useful as a means of familiarizing themselves with the fundamentals of the science on which high polymer products are based.

•

Information and Communication Practice in Industry. Edited by T. E. R. Singer. Published by Reinhold Publishing Corp., 430 Park Avenue, New York 22, N. Y. 6 x 9½ in. 304 pp. $8.75.

The most efficient method of conveying technical information has been and remains a problem for the rubber and all industries. This book, edited by the program chairman of the Division of Chemical Literature, American Chemical Society, presents the thoughts of 22 experts on how they think it can best be accomplished. The opening paper is on the functions and organization of the industrial information department, a unit which is becoming an entity in its own right in many companies. This is followed by a chapter on current trends in linguistics, language and terminology.

Other papers are on mechanical aids in the presentation of technical papers, technical illustrations, technical writing, editing technical reports, fundamentals of designing tables of data, indexing and abstracting. Also included are several papers on classifying and filing technical information. Many ideas pertinent to this time of increasing volume and complexity in the publication of technical material are presented.

Adhesives and Sealants in Building. (Publication No. 577.) Published by National Academy of Sciences, 2101 Constitution Ave., Washington 25, D. C. 8½ x 11 in. 160 pp. $5.00.

This book contains 22 papers presented at a conference on the use of adhesives and sealants for construction purposes sponsored by the Building Research Institute of the National Academy of Sciences in Washington, D. C., on December 4-5, 1957. Designed to offer the most complete picture possible on the present status of adhesive materials in the building industry, the book is divided into five sections: (1) Introduction, which contains five papers on basic information and applications; (2) Sealing Joints in the Building Exterior, which is divided into two sub-parts on traditional materials and metal curtain walls; (3) Adhesives for the Building Interior, which covers materials for floors, walls, ceilings and work surfaces; (4) Adhesives for Structural Materials and Components, which contains subsections on cementitious materials and lumber products, and on sandwich panels; and (5) The Future of Adhesives and Sealants in Building.

Many of the papers contain information of direct or indirect interest to the rubber industry, such as "Butyl Compounds for Curtain Wall Sealants," by R. J. Kraynick and Felix Konstandt in which the advantages of butyl rubber compounds for curtain wall sealants are listed and discussed. A rubber latex-based product for use with resilient flooring is described in "Adhesives for Floor Surfacing Materials," by R. B. Rohrer. In a paper on "Adhesives for Walls, Ceilings and Work Surfaces," John W. Bruce, Jr., analyzes the use of a reclaim rubber mastic type adhesive in vinyl-clad steel laminates and their application in sandwich panels.

Other papers include: "The Importance of Adhesives and Sealants in Building," by Albert G. H. Dietz; "Adhesives," by G. W. Koehn, in which the author outlines the general field of adhesives and presents basic information on various types, and defines terms; "Sealing Compounds and Tapes," by Gordon E. Hann; "Preformed Gasketing Materials and Tapes," by H. F. Kleinhans; and "Pressure Sensitive Tapes," by Martin H. Gerstel. A generous use of photographs and schematic diagrams supplements the text. No less valuable than the papers are the panel discussions which concluded each session of the meeting and which are presented in full. The book represents the first major effort at correlation of research data in the adhesives field as applied to buildings. It is a successful pioneer effort.

•

The Properties and Testing of Plastics Materials. By A. E. Lever and J. Rhys. Published by Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. 6 x 9¼ in. 198 pp. $4.75.

This reference work for those engaged in the testing of plastics contains comparative technical information, much of it in readily understandable tabular form, on a wide variety of materials employed in plastics manufacture. The authors have assembled data on the testing of plastics from a wide sample of the literature (over 1,600 references are given), and assembled it for ready use. Emphasis is on the practical rather than the theoretical features of the field.

The main topics covered are general principles; physical, thermal, optical and electrical properties; sundry chemical and physical properties, and identification and analysis. Four appendices are included: Special Tests and Properties of Industrial Materials; Testing of Finished Moldings; Efficiency of Plasticizers, and Standards Organizations. A glossary of publications and a subject index close the volume.

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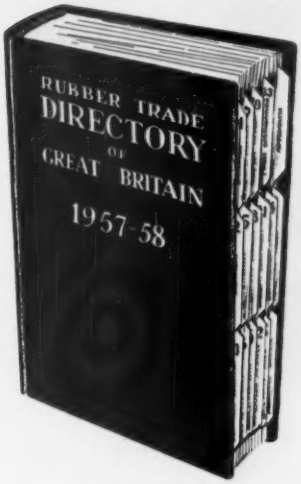

RUBBER TRADE DIRECTORY OF GREAT BRITAIN 1957-58

THIRD EDITION

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3. Instruments and Laboratory Equipment
4. Chemicals and Compounding Ingredients
5. Fabrics and Textiles
6. Components
7. Natural Rubbers and Latices
8. Synthetic Rubbers, Latices and Kindred Materials
9. Reclaimed Rubbers
10. Scrap and Waste Rubber Merchants
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BOOKLETS, CATALOGS, etc.

Static Power Adjustable Speed Drives. Cutler-Hammer, Inc., Milwaukee 1, Wisc. 8½ x 11 in. 14 pp.

Ultraflex Packaged Drives, complete packaged drives with industrial type DC motors produced by Cutler-Hammer, are the subject of this publication. A complete description of the Ultraflex M, which utilizes magnetic amplifiers for power conversion, is given; the Ultraflex E, which employs industrial electronic tubes, is presented briefly. The different aspects of the drives —basic design, control, power conversion units, component parts, motors, and protective system—are discussed individually. One page is devoted to a sizes-and-dimensions chart which gives panel size, case dimensions and type of mounting for the drives in sizes from 1 to 200 horsepower. Specific information needed in selecting a suitable drive for a particular installation is also listed.

•

Synthetic Rubber Facts. Synthetic Rubber and Latex Division, Firestone Tire & Rubber Co., Akron 1, Ohio. 7¾ x 10 in. Loose-leaf.

This valuable publication contains a large quantity of information on synthetic rubber. Divided into the sections on history, economics and chemistry, specifications, test methods, handling, applications of latex, applications of rubber, and tables, it is practically a basic guidebook to synthetic rubber technology. Although emphasizing the Firestone synthetics, revelant data on the rubbers and compounding ingredients of other companies are included, with indications of trade names and suppliers. The binding is loose-leaf, for inclusion of additional pages which will be released from time to time in the future. A handsome and comprehensive publication.

•

Rubber Chemicals for Cables. Dyestuffs Division, Imperial Chemical Industries Limited, P. O. Box 42, Hexagon House, Blackley, Manchester 9, England. 6 x 9½ in. 138 pp.

This publication deals with the use of rubber chemicals in the insulation, sheathing and ancillary compounds of rubber cable manufacture. It offers a guide to the selection of chemicals best fitted to obtain desired results, and illustrates their functions by means of specific examples of cable compounds. Raw materials are described in detail, beginning with various polymers and going down the list of additives from accelerators to finishing agents. Numerous formulations to meet specific needs are given, and physical properties of the vulcanizates are detailed. A valuable publication for a specific segment of the industry.

•

What Is the Rubber Industry? The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York 22, N. Y. 8½ x 11 in. 16 pp.

Many basic questions about the rubber industry are answered in this publication. Prompted by a constantly growing number of inquiries about factors behind the great post-war growth and diversification of the field, this booklet presents a survey of just what composes the industry. Brief analyses of the types and kinds of companies which produce rubber products, of their research, the variety of their products, and uses of rubber in national defense are given. A particularly valuable section, titled "Inside the Rubber Industry," breaks down statistically various data on sales, wages, earnings, taxes and other financial aspects of the manufacture of rubber and rubber goods. A valuable publication.

The Effect of Moisture Content of Metallic Chloride Catalysts on the Dimethylol Phenol Cure. (Bulletin No. 100-4C). Thiokol Chemical Corp., 780 North Clinton Ave., Trenton, N. J. 8½ x 11 in. 12 pp.

This bulletin analyzes the effect of moisture content on the efficiency of metallic chloride catalysts in the dimethylol phenol resin cure for butyl rubber. Data indicate the results obtained using both ferric and stannous chloride catalysts with varying amounts of moisture, including the commercial, hydrated forms. Tables and curves are included which show the effects of both cure temperature and moisture content on cure activity, physical properties, compression set and heat resistance of compounds.

•

How Abrasive Belt Grinding Increases Production at Lower Cost. Engelberg Huller Co., 831 West Fayette St., Syracuse 4, N. Y. 8½ x 11 in. 24 pp.

This two-color booklet contains over thirty illustrated case histories selected after a two-year coast-to-coast survey of Engelberg abrasive belt machine applications. Data include production figures, type of belts used, belt life, fixturing, comparison with prior or alternative methods, and stock removal, tolerance and finish specifications. Plant installations show how abrasive belt grinders reduce equipment, set-up, material and reject costs. Production versatility is illustrated by a wide variety of parts with operating data on plastics, phenolic laminates, metals, glass, etc.

•

Diamond Precipitated Calcium Carbonates in Neoprenes. Diamond Alkali Co., 300 Union Commerce Building, Cleveland 14, Ohio. 8½ x 11 in. 12 pp.

This bulletin presents data on the range of properties obtainable with Diamond precipitated calcium carbonates when used as fillers in neoprene rubbers. Basic formulations for Neoprene GN and Neoprene W are given. Eight tables summarize modulus (300% and 500%), tensile, elongation, crescent tear and Shore "A" hardness properties of each formulation utilizing 50, 75, 100 and 125 part loadings of six different precipitated calcium carbonates at press cures of 7½, 15, 25 and 35 minutes at 307°F.

•

Pelleted Accelerators for Rubber. (Technical Service Bulletin No. 14A/1). Monsanto Chemicals Limited, Monsanto House, 10-18 Victoria Street, London, S.W.1, England. 8 x 10 in. 8 pp.

This short technical bulletin lists the advantages offered by the use of rubber accelerators in pelletized form, and then compares the effects of powder versus pellets of nine accelerators available in both forms. Tables are used to compare mixing time and degree of mill sticking, and physical properties of natural rubber stocks as affected by using the accelerators in each of the forms. Lack of effect on cure rate by varying the form is also discussed.

•

Santovar A. Monsanto Chemicals Limited, Monsanto House, 10-18 Victoria St., London, S.W. 1, England. 8 x 10 in. 4 pp.

The advantages of using Santovar A, a stabilizer for rubber against heat degradation due to oxidation or the deleterious action of sunshine, are enumerated in this bulletin. Experimental data include details of studies of aging on unvulcanized rubber, a tape compound and vulcanized rubber stock. Properties of Santovar A (2,5 di-tert-amylhydroquinone) are listed.

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MARKET REPORTS

TRENDS
NEWS
PRICES

Natural Rubber

Since our last report (September 2), the price of spot rubber on the New York Commodity Exchange has moved in a range of 150 points, high for the period being 30.25c reached on September 22, and low being 28.75c reached on September 3 and again on September 4. The average price of spot rubber for the month of September was 29.49c based upon 21 trading days. This compares with an average of 28.72c in the previous month.

More and more talk is being heard from consumers about the readjustment in rubber prices which has seen the average price of natural moving substantially higher than synthetic. While the disparity in prices may influence natural rubber consumption, many in the trade believe that this change in the pattern will not come about for some time to come.

Technical Preference

It has been pointed out that in consuming countries other than the United States, synthetic consumption now accounts for about 25 per cent of total new rubber usage. There is little possibility that natural rubber will reduce this percentage. On the other hand, should natural rubber prices go above 30c and remain there for some time, the possibility exists that synthetic will make substantial gains.

This is not the case in the United States, however, many in the trade state. A relatively high price for natural rubber in the United States would probably not make too much of a difference as far as the synthetic preference ratio is concerned. It is believed that the technically preferred zone for natural rubber is substantially near a 25 per cent level.

Of immediate interest is the fact that economic conditions in the past year have encouraged conservation of purchases and use of truck tires. For the most part, truck companies have been "living on inventories." These inventories must soon be replenished and this will take more and more natural rubber, many in the trade believe.

U.S. Natural Consumption

Figures available from the Rubber Manufacturers Association indicate that a total of 306,332 long tons of natural rubber were imported into the United States in the first eight months of 1958, compared with the 360,979 long tons imported in the first eight months of the preceding year.

As for consumption, in the first eight months of 1958 a total of 301,011 long tons of natural rubber were consumed in the United States, contrasted with the 364,565 long tons consumed in the similar period of the preceding year. As of August 31, 1958, there were 84,196 long tons of natural rubber in stocks against the 99,093 long tons on hand on August 31, 1957.

NEW YORK, OCTOBER 1, 1958

Price Data

Closing Rubber Prices on New York Commodity Exchange

FROM SEPT. 1 TO SEPT. 30

Sept.	Spot	Nov.	Jan.	Mar.	Sales
1	....	....	....	....	..
2	28.88	28.50	28.25	28.15	3
3	28.75	28.32	28.10	28.05	46
4	28.75	28.44	28.40	28.34	31
5	29.13	28.75	28.55	28.45	25
6	....	....	....	....	..
7	....	....	....	....	..
8	28.88	28.47	28.37	28.22	24
9	29.13	28.80	28.65	28.50	38
10	29.38	28.90	28.66	28.55	24
11	29.13	28.85	28.65	28.55	23
12	29.25	28.95	28.70	28.60	21
13	....	....	....	....	..
14	....	....	....	....	..
15	29.38	29.15	28.93	28.80	24
16	29.38	29.00	28.85	28.75	36
17	29.63	29.40	29.20	29.10	46
18	29.63	29.25	29.15	29.03	98
19	29.75	29.35	29.10	29.05	85
20	....	....	....	....	..
21	....	....	....	....	..
22	30.25	29.75	29.60	29.50	16
23	30.00	29.65	29.40	29.32	70
24	29.88	29.65	29.20	29.32	31
25	29.75	29.55	29.30	29.25	26
26	30.00	29.60	29.50	29.40	45
27	....	....	....	....	..
28	....	....	....	....	..
29	30.13	29.85	29.70	29.50	28
30	30.13	29.95	29.78	29.62	28

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.30
Nov.	.29⅞
Dec.	.29¾
Thin Latex Crepe:	
Spot	.33
Thin Brown Crepe, No. 2	.24⅞
Flat Bark Crepe	.20

London Market
(Standard Smoked Sheets)

Nov.	28.96 — 29.25
Jan.-Mar.	29.54 — 29.69

Singapore Market
(Standard Smoked Sheets)

Nov.	27.79 — 27.83

Middling Upland Quotations

	Sept. 2	October 1		
	Close	High	Low	Close
Dec.	35.70	36.22	36.14	36.22
Mar.	36.02	36.70	36.63	36.66
May	35.79	36.49	36.43	36.44

Notes & Quotes

If present gains in education, leisure and living standards are to continue at the rate they have in the past, the production rate of the average American at work will have to double by 1978, according to Henry B. du Pont, a vice-president and a director of E. I. du Pont de Nemours & Co., Inc. Assuming a continuation of the present rate of gain, each individual 20 years hence will require of the economy the equivalent in goods and services to that used by two persons today. To achieve such a goal, the adoption of modern instrumentation processes will be required.

Synthetic Rubber

The Rubber Manufacturers Association advises that consumption of all types of synthetic rubber in August amounted to 70,811 long tons as compared with July's consumption of 63,865 long tons. Of the total new rubber consumed in August, synthetic rubber accounted for 64.46 per cent, as compared with the July ratio of 65.10 per cent.

The ratio of synthetic rubber to total new rubber consumed amounted to 64.22 per cent for the first eight months of the current year, as compared with a ratio of 62.88 per cent for the first eight months of 1957.

Production of synthetic rubber in the first eight months of 1958 amounted to 87,320 long tons against the 93,421 long tons consumed in the first eight months of 1957.

Price Influences

With natural rubber approaching a 30c level, some in the trade are of the opinion that there will be an upsurge in synthetic consumption in the balance of the year. Others, however, believe that the "technical preference" ratio has now been brought into play and that even with natural rubber at a 30c level, consumption at year end will still be in the order of 35 per cent natural against 65 per cent synthetic.

The interrelation of natural and synthetic rubber can thus be viewed from two different angles and there are likely several other points of view which should be considered. What would happen, for example, if heavy Soviet bloc purchases were to create temporary shortages of natural in Europe?

If such were the case, would there be a marked turn to synthetic rubber in Europe? Would a marked upturn in synthetic rubber demand coupled with rising American demand dictate a price adjustment for synthetic in this country? In turn, would an increased price for synthetic further stimulate or depress natural rubber prices?

Question of Stocks

To the foregoing questions we can add several others. Stocks of synthetic rubber are relatively high. Of what importance is this fact? Does it have major bearing upon the situation? What about natural rubber stocks in this country exclusive of the government stockpile?

In the over-all, some things are apparent. Synthetic rubber continues to grow as far as the preference ratio is concerned. Rising consumption of new rubber in the world would seem to indicate a stable market for all the natural which will be produced for the next several years so that perhaps the battle is more one of statistics than of markets. At any rate, developments in the next few months will bear our close attention.

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Butaprene NF	.4900 [1]
Butaprene NH	.6500 [1]
Butaprene NL	.5000 [1]
Butaprene NXM	.5800 [1]
Chemigum N1	.6400 [2]
Chemigum N3	.5800 [2]
Chemigum N5	.5800 [2]
Chemigum N6	.5000 [2]
Chemigum N6B	.5000 [2]
Chemigum N7	.5000 [2]
Chemigum N8	.5000 [2]
Herecol N-33	.6800 [2]
Hycar 1001	.5800 [2]
Hycar 1002	.5000 [2]
Hycar 1014	.6000 [2]
Hycar 1041	.5800 [2]
Hycar 1042 and 1043	.5000 [2]
Hycar 1312	.5000 [2]
Hycar 1411	.6200 [2]
Hycar 1432	.5900 [2]
Hycar 1441	.6200 [2]
Paracril AJ	.4850 [2]
Paracril B	.5000 [2]
Paracril BJ	.5000 [2]
Paracril BLT	.5000 [2]
Paracril C	.5800 [2]
Paracril CV	.5900 [2]
Paracril D	.6500 [2]
Paracril OZO	.4600 [1]
Paracril 18-80	.6000 [2]
Polysar Krynac 800	.5000 [2]
Polysar Krynac 801	.5800 [2]
Polysar Krynac 802	.5000 [2]
Polysar Krynac 803	.5000 [2]

Butadiene-Styrene Types

Ameripol 1000	.2410 [2]
Ameripol 1001	.2410 [2]
Ameripol 1002	.2435 [2]
Ameripol 1006	.2410 [2]
Ameripol 1006 (crumb)	.2475 [2]
Ameripol 1007	.2410 [2]
Ameripol 1009	.2475 [2]
Ameripol 1011	.2550 [2]
Ameripol 1012	.2425 [2]
Ameripol 1012 (crumb)	.2540 [2]
Ameripol 1013	.2500 [2]
Ameripol 1500	.2410 [2]
Ameripol 1501	.2410 [2]
Ameripol 1502	.2410 [2]
Ameripol 1703	.2060 [2]
Ameripol 1705	.2035 [2]
Ameripol 1707	.1910 [2]
Ameripol 1708	.1910 [2]
Ameripol 1710	.1885 [2]
Ameripol 1712	.1885 [2]
Ameripol 4700	.1750 [2]
Ameripol 4701	.1725 [2]
ASRC 1000	.2410 [2]
ASRC 1001	.2401 [2]
ASRC 1004	.2401 [2]
ASRC 1006	.2410 [2]
ASRC 1009	.2475 [2]
ASRC 1018	.2700 [2]
ASRC 1019	.2650 [2]
ASRC 1500	.2410 [2]
ASRC 1502	.2410 [2]
ASRC 1503	.2625 [2]
ASRC 1703	.2060 [2]
ASRC 1708	.1910 [2]
ASCR 3110	.2600 [2]
Baytown 1600	.1760 [2]
Baytown 1601	.1760 [2]
Baytown 1602	.1760 [2]
Baytown 1801	.1600 [2]
Carbomix 3750	.1820 [2]
Carbomix 3751	.1545 [2]
Carbomix 3752	.1870 [2]
Carbomix 3753	.1640 [2]
Carbomix 3754	.1790 [2]
Carbomix 3755	.1535 [2]
Copo 1500	.2410 [2]
Copo 1502	.2410 [2]
Copo 1505	.2610 [2]
Copo 1712	.1885 [2]
Copo 1773	.2060 [2]
Copo 1778	.1910 [2]
Copo 3900	.2310 [2]
FR-S 1000	.2410 [2]
FR-S 1001	.2410 [2]
FR-S 1004	.2410 [2]
FR-S 1006	.2410 [2]
FR-S 1009	.2475 [2]
FR-S 1010	.2600 [2]
FR-S 1012	.2425 [2]
FR-S 1013	.2500 [2]
FR-S 1014	.2810 [2]
FR-S 1015	.2910 [2]
FR-S 1500	.2410 [2]
FR-S 1502	.2410 [2]
FR-S 1703	.2060 [2]
FR-S 1705	.2035 [2]
FR-S 1712	.1885 [2]
Naugapol 1016	.2650 [2]
Naugapol 1018	.2700 [2]
Naugapol 1019	.2650 [2]
Naugapol 1021	.3000 [2]
Naugapol 1022	.2800 [2]
Naugapol 1023	.2850 [2]
Naugapol 1503	.2625 [2]
Naugapol 1504	.2950 [2]
Philprene 1000	.2410 [1]
Philprene 1001	.2410 [1]
Philprene 1006	.2410 [1]
Philprene 1009	.2475 [1]
Philprene 1010	.2600 [1]
Philprene 1018	.2700 [1]
Philprene 1019	.2650 [1]
Philprene 1100	.1940 [1]
Philprene 1104	.1900 [1]
Philprene 1500	.2410 [1]
Philprene 1502	.2410 [1]
Philprene 1503	.2625 [1]
Philprene 1600	.1930 [1]
Philprene 1601	.1930 [1]
Philprene 1605	.1900 [1]
Philprene 1703	.2060 [1]
Philprene 1706	.2030 [1]
Philprene 1708	.1910 [1]
Philprene 1712	.1885 [1]
Philprene 1803	.1740 [1]
Plioflex 1006	.2410 [2]
Plioflex 1500	.2410 [2]
Plioflex 1502	.2410 [2]
Plioflex 1703	.2060 [2]
Plioflex 1710	.1885 [2]
Plioflex 1712	.1885 [2]
Plioflex 1773	.2060 [2]
Plioflex 1778	.1910 [2]
Polysar Kryflex 200	.2510 [2]
Polysar Krylene	.2410 [2]
Polysar Krylene NS	.2410 [2]
Polysar Krynol 651	.1885 [2]
Polysar Krynol 652	.1910 [2]
Polysar S	.2410 [2]
Polysar S-50	.2410 [2]
Polysar S-X 371	.2550 [2]
Polysar SS-250	.2875 [2]
S-1000	.2300 [2]
S-1002	.2325 [2]
S-1006	.2300 [2]
S-1009	.2400 [2]
S-1011	.2325 [2]
S-1013	.2300 [2]
S-1100	.1850 [2]
S-1500	.2300 [2]
S-1502	.2300 [2]
S-1506	.2500 [2]
S-1600	.1825 [2]
S-1602	.1825 [2]
S-1703	.1950 [2]
S-1706	.1925 [2]
S-1707	.1800 [2]
S-1709	.1775 [2]
S-1712	.1775 [2]
S-1803	.1650 [2]
S-1804	.1750 [2]
Synpol 1000	.2410 [1]
Synpol 1001	.2410 [1]
Synpol 1002	.2435 [1]
Synpol 1006	.2410 [1]
Synpol 1007	.2410 [1]
Synpol 1009	.2475 [1]
Synpol 1012	.2425 [1]
Synpol 1013	.2500 [1]
Synpol 1061	.2410 [1]
Synpol 1500	.2410 [1]
Synpol 1502	.2410 [1]
Synpol 1551	.2410 [1]
Synpol 1703	.2060 [1]
Synpol 1707	.1910 [1]
Synpol 1708	.1910 [1]
Synpol 1711	.1900 [1]
Synpol 1712	.1885 [1]

Butyl Rubbers

Enjay Butyl 035 and 150	.2300 [2]
Enjay Butyl 165 NS	.2400 [2]
Enjay Butyl 215	.2300 [2]
Enjay Butyl 217	.2300 [2]
Enjay Butyl 218	.2300 [2]
Enjay Butyl 268 NS	.2400 [2]
Enjay Butyl 325	.2300 [2]
Enjay Butyl 365 NS	.2400 [2]
Polysar Butyl 100	.2450 [2]
Polysar Butyl 101	.2775 [2]
Polysar Butyl 200 and 300	.2450 [2]
Polysar Butyl 301	.2550 [2]
Polysar Butyl 400	.2450 [2]

Chlorosulfonated Polyethylene

Hypalon 20	.7000 [2]
Hypalon 30	.7000 [2]

Neoprene

	(prices l.c.l.)
Neoprene Types AC and CG	.5500 [2]
Neoprene Type AD	.5500 [2]
Neoprene Type FB	.6500 [2]
Neoprene Type GN	.4100 [2]
Neoprene Type GN-A	.4100 [2]
Neoprene Type GRT	.4200 [2]
Neoprene Type KNR	.7500 [2]
Neoprene Type S	.4200 [2]
Neoprene Type W	.3900 [2]
Neoprene Type WB	.4100 [2]
Neoprene Type WHV	.3900 [2]
Neoprene Type WRT	.4500 [2]
Neoprene Type WX	.4100 [2]

Polysulfide Rubbers

	(prices l.c.l.)
Thiokol Type A	.5000 [2]
Thiokol Type FA	.6900 [2]
Thiokol Type ST	1.2500 [2]

Silicone Rubbers*

	(prices l.c.l.)
GE (compounded)	2.50 [2]
GE Silicone Gum (not compounded)	4.00 [2]
Silastic (compounded)	1.90 [2]
Silastic (gums)	3.85 [2]
Union Carbide (gums)	4.00 [2]
Union Carbide (compounds)	2.50 [2]

Latex

(per pound carload)

Butadiene-Acrylonitrile Types

Butaprene N-300	.4600 [1]
Butaprene N-400	.5400 [1]
Butaprene N-401	.5400 [1]
Chemigum 200	.4900 [2]
Chemigum 235	.5400 [2]
Chemigum 236	.5400 [2]
Chemigum 245	.4600 [2]
Chemigum 246	.4600 [2]
Chemigum 247	.4600 [2]
Chemigum 248	.4600 [2]
Hycar 1512	.4600 [2]
Hycar 1551	.5400 [2]
Hycar 1552	.4600 [2]
Hycar 1561	.5400 [2]
Hycar 1562	.4600 [2]
Hycar 1571	.5400 [2]
Hycar 1572	.5100 [2]
Hycar 1577	.4600 [2]
Hycar 1852	.4600 [2]
Nitrex 2612	.4600 [1]
Nitrex 2614	.4600 [1]
Nitrex 2614-A	.4600 [1]
Nitrex 2615	.5100 [1]
Nitrex 2615-A	.5100 [1]
Nitrex 2616	.5400 [1]
Nitrex 2617	.4600 [1]
Nitrex 2617-A	.4600 [1]
Nitrex 2619	.5300 [1]
Nitrex 2620	.4600 [1]
Nitrex 2625	.4600 [1]

Butadiene-Styrene Types

Copo 2101	.3000 [2]
Copo 2102	.3200 [2]
Copo 2105	.3200 [2]
Copo 2108	.3375 [2]
Copo 2110	.3200 [2]
Copo X-800	.2775 [2]
FR-S 2000	.2775 [2]
FR-S 2001	.2775 [2]
FR-S 2002	.3000 [2]
FR-S 2003	.3050 [2]

POLYMERS

FR-S 2004	.3050 [3]
FR-S 2006	.2900 [3]
FR-S 2105	.3200 [3]
Naugatex 2000	.2775 [1]
Naugatex 2001	.2775 [1]
Naugatex 2002	.3000 [1]
Naugatex 2006	.2900 [1]
Naugatex 2105	.3200 [1]
Naugatex 2107	.3200 [1]
Naugatex 2108	.3000 [1]
Pliolite 2000	.2775 [3]
Pliolite 2001	.2775 [3]
Pliolite 2076	.2900 [3]
Pliolite 2104	.3200 [3]
Pliolite 2105	.3200 [3]
Pliolite 2107	.3200 [3]
Pliolite 2108	.3000 [3]
S-2000	.2275 [3]
S-2006	.2150 [3]
S-2101	.2250 [3]
S-2105	.3100 [3]
S-2107	.3200 [3]

Neoprene

Neoprene Latex 60	.4000 [3]
Neoprene Latex 571	.3700 [3]
Neoprene Latex 572	.3900 [3]
Neoprene Latex 601-A	.4000 [3]
Neoprene Latex 673	.5000 [3]
Neoprene Latex 735	.3800 [3]
Neoprene Latex 736	.3800 [3]
Neoprene Latex 842-A	.3700 [3]
Neoprene Latex 950	.4700 [3]

Polysulfide Rubbers

Thiokol Type MX	.8000 [3]
Thiokol Type WD-2	1.2500 [3]
Thiokol Type WD-6	.8000 [3]

Notes: (1) Freight allowed. (2) Freight extra. (3) Freight prepaid. *Covers a wide range of compounds. Readers are urged to check specific prices with producers.

SUPPLIERS

Are Your

Synthetic Rubbers

Listed

in This Section?

if not

Forward full information

to

Market Editor

RUBBER AGE

101 West 31st St.,

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DAY

DUST CONTROL NEWS

DAY "RJ" Dust Filter Operates for Pennies NOT Dollars

DAY has simplified dust filter design *without sacrificing high efficiency*. That's why there's so much interest in the DAY "RJ" dust filter. Simplified design means fewer parts, lower operating costs and less maintenance. With the DAY "RJ" costly compressed air, complicated valves, timers, shaking or rapping devices are *NOT* required. The entire counter air flow mechanism (the reason for the "RJ's" continuous, high efficiency) is operated by one small motor which varies from ½ h.p. to 1½ h.p., depending upon the model selected.

The DAY "RJ" dust filter will handle light or heavy dust laden air streams. It filters fine, coarse, abrasive or non-abrasive dusts with outstanding efficiency ratings. Recent orders for 49 DAY "RJ" units came from 31 companies already using this filter — substantial proof of owner satisfaction. For complete specifications write toDAY for Bulletin G-579.

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MARKETS

(continued)

Reclaimed Rubber

According to the trade, reclaimed rubber consumption has remained fairly steady during the past period. Replacement tire business has set new highs in sales volume counteracting lower sales levels for original equipment tires. However, September orders would seem to indicate that original equipment tires are on the upswing.

Several tire manufacturers are said to have uncovered processing advantages if reclaim is used in truck tire undertread and sidewall compounds. These factors have contributed to the current stability of the reclaim market. There is also an indication that reclaim consumption will increase through the balance of the current year.

RMA indicates that in the first eight months of this year a total of 163,681 long tons of reclaimed rubber were produced in the United States while 156,251 were consumed. These figures compare with 184,692 and 181,536, respectively, in the first eight months of 1957.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.11½
First Line Whole Tire	.11
Second Line Whole Tire	.10½
Third Line Whole Tire	.10¼
Fourth Line Whole Tire	.09¾
Black Carcass	.15¼
No. 1 Light Colored Carcass	.22
No. 1 Peel	.11
Butyl Tub Reclaim	.14
Natural Rubber Black Tube	.16
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

The scrap rubber market has begun to display a firmer tone with activity at a somewhat quickened pace. Consumers are showing more interest in acquiring supplies. Prices for some tubes were reported to be a little stronger than heretofore.

A heightening of activity in the automobile industry as a result of the introduction of 1959 models as well as an upturn in the general economy would seem to indicate an equivalent upturn in the scrap rubber market. By year end, many of the trade believe, total consumption will be in the order of 220,000 to 230,000 long tons. This is somewhat higher than expected earlier in the year.

(Prices Delivered Akron)

Mixed tires	ton	14.00
Light colored carcass	lb.	.04¼
No. 1 peelings	ton	28.00
No. 2 peelings	ton	25.00
No. 3 peelings	ton	18.00
Buffings	ton	16.00
Truck and Bus S.A.G.	ton	19.00
Passenger S.A.G.	ton	17.00
Natural Rubber Red Tubes	lb.	.07½
Natural Rubber Black Tubes	lb.	.06¾
Butyl Rubber Tubes	lb.	.04¼

Tire Fabrics

One of the nation's largest farm cooperatives has reported a 200 per cent gain in sales of nylon cord passenger tires during the first half of 1958. According to the Farmers' Union Central Exchange, St. Paul, Minn., nylon cord tires now represent 65 per cent of total passenger tire sales, as compared to 20 per cent last year.

All first-line passenger tires handled by Farmers' Union are made with nylon cord, and about one-half of the cooperative's second line tires are built with nylon. Along with the increase in sales of nylon cord passenger tires, there has been an accompanying hike in sales of nylon truck tires, with that type now accounting for approximately half of the total truck tire volume.

Vinyl Lamination Gains

According to Henry W. Wyman, vice-president of the Pantasote Co., the vinyl plastic coated fabric market is having ever-increasing acceptance in many fields, especially where heavy coating deposits are required. Lately, however, there has been a marked transition to the laminated process.

This process is said to offer many advantages in that a relatively light gauge film can be laminated to cloth without fabric irregularities showing through. In the case of coating, this requires a much heavier deposit, Mr. Wyman stated.

Another important advantage, is that in case of film going off on color or on decoration, it can be re-run with little or no loss. Laminates offer not only the advantage of laminating vinyl film to cloth, but the possibility of laminating various layers of vinyl for effect as well as laminating other types of plastics such as metallized Mylar to vinyl and, in turn, laminating to fabric.

Within the last year, fields such as outdoor furniture, sun umbrellas, lightweight tarpaulins, wall coverings, automotive trimming, etc., have turned to the laminated type material replacing coated material. These laminated materials are now finding ready markets, trade reports note.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.73
1650	lb.	.67
2200	lb.	.67½

Nylon Tire Cord

210	lb.	1.95
840	lb.	1.70

Rayon Graded Fabric

1100	lb.	.69
1650	lb.	.63½
2200	lb.	.63

Cotton Chafers

8.9	oz. (per square yard)	lb.	.68
9.25	oz. (per square yard)	lb.	.66
11.65	oz. (per square yard)	lb.	.62
14.4	oz. (per square yard)	lb.	.71

Liquid Latex

Natural: Figures available from the Rubber Manufacturers Association indicate that in the first eight months of the current year a total of 43,459 long tons of natural rubber latex were imported into the United States against the 49,150 long tons imported in the first eight months of the preceding year.

According to RMA, 41,363 long tons of natural rubber latex were consumed in the first eight months of this year against the 48,234 long tons consumed in the first eight months of last year. As of August 31, 1958, there were 13,589 long tons of natural latex in stocks, contrasted with the 13,535 on hand as of August 31, 1957.

Natural latex prices are currently being quoted at a 36 to 37c level at East Coast ports in car load lots. The possibility exists that some consumer resistance may arise at these levels but not too much difficulty is anticipated. It now seems as if some 63,000 long tons of natural latex will be consumed this year. It will be remembered that consumption in 1957 totaled 75,009 long tons.

Synthetic: Department of Commerce figures show that in the first seven months of the current year a total of 30,438 long tons of S-type latex were produced in the United States, considerably less than the 42,634 long tons produced in the first seven months of the previous year.

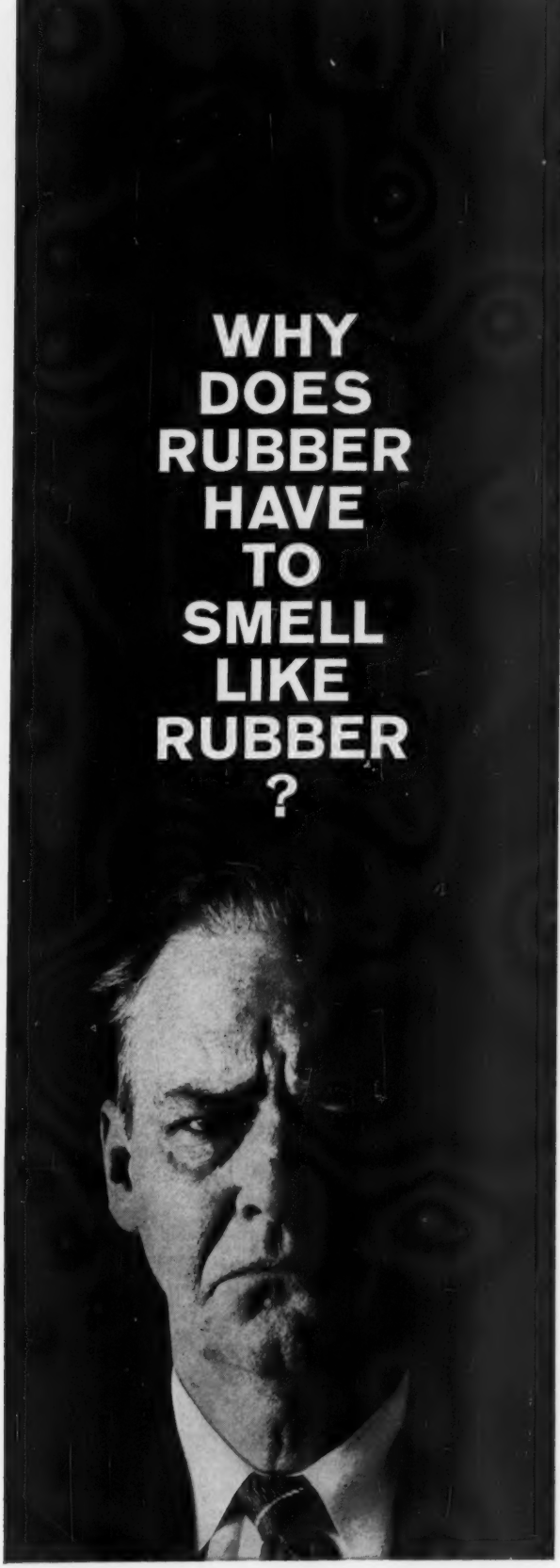
Consumption of S-type latex in the first seven months of this year amounted to 30,414 long tons against the 38,847 long tons consumed in the first seven months of 1957. At the end of July, 1958, there were 6,693 long tons of S-type latex on hand, compared with the 8,045 long tons on hand on July 31, 1957.

Cotton

The price of middling uplands cotton on the New York Cotton Exchange has moved in a range of 130 points since our last report (September 2), high for the period being 36.20c reached on September 2, and low being 34.90c reached on September 22. The average price of middling uplands for the month of September was 36.00c based upon 21 trading days. This compares with an average of 36.36c in August.

The Department of Agriculture forecasts that the cotton harvest this year will total 12,105,000 bales and that there will be a record yield of 486 pounds to the acre. The Department said that the new crop, added to the 8,700,000 bales left from previous years, will fill this country's domestic and foreign needs for about a two year period.

The new estimate, based on conditions as of September 1, added 522,000 bales to the forecast issued just one month previous. The 1958 crop will thus be 1,141,000 bales larger than last year's, but 2,031,000 smaller than the ten year average. The yield this year will surpass the previous high of 417 pounds per acre set in 1955.



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MARKET PRICES

CHEMICALS & COMPOUNDING INGREDIENTS

OCTOBER 1, 1958

Prices are, in general, f.o.b. works and cover the domestic markets only. Export prices, as a rule, are usually slightly higher, due to packing regulations, special handling, etc.

Abbreviations: bbls., barrels; c.l., carload; cyl., cylinder; dlvd., delivered; dms., drums; eqld., equalized; l.c.l., less than carload; M.B. masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

*Trademark. †For Export Only.

The arrangement of this section closely follows the Chemical Section of the 1957-58 RUBBER RED BOOK. Readers are referred to that edition for the correct classification of any material or brand name. Suppliers of every material are contacted for price information. However, only those materials are listed for which quotations have been furnished within the past six months. The quotations are not guaranteed and prospective purchasers should contact suppliers for information. Suppliers are requested to send current price information to the Market Editor, RUBBER AGE.

ACCELERATORS

A-1 (Thiocarbanilide)*	lb.	.74	.81
A-32*	lb.	.66	.80
A-100*	lb.	.52	.66
Accelerator No. 8*	lb.	—	1.25
Accelerator—49*	lb.	.59	.60
Accelerator 89*	lb.	—	1.20
Accelerator 108*	lb.	.92	.97
Accelerator—552*	lb.	—	2.25
Accelerator—808*	lb.	.66	.68
Accelerator—833*	lb.	1.17	1.19
Accelerator B*	lb.	—	.89
Altax*	lb.	.54	.56
Amax*	lb.	.80	.82
No. 1*	lb.	.76	.78
Ancap*(†)	lb.	.38	.40
Ancatax*(†)	lb.	.48	.50
Ancazate BU (ET & ME)*(†)	lb.	—	1.07
Ancazide ET*(†)	lb.	—	1.07
ME*(†)	lb.	—	1.14
Arazate*	lb.	—	2.25
Arquad 12*	lb.	.55	.61
Beutene*	lb.	.66	.71
Bismate, Rodform*	lb.	—	3.00
Butazate*	lb.	.87	.92
Butyl Eight*	lb.	1.10	1.35
Butyl Namate	lb.	.45	.50
Butyl, Ethyl & Methyl Zimate Slurry (50% solids content)	lb.	.85	.89
Captax*	lb.	.44	.46
C-P-B*	lb.	1.95	2.00
Cumate, Rodform*	lb.	—	1.45
Cydac*		.76	.78
DIBS*		—	.85
Diorthotolyguanidine	lb.	.69	.70
Dipac*	lb.	—	.85
Diphenylguanidine	lb.	.49	.50
Ei-Sixty*	lb.	.62	.69
Ethazate*	lb.	—	1.04
50D*	lb.	.87	.92
Ethyl Thiurad*	lb.	—	1.04
Ethyl Tuex*	lb.	—	1.04
Ethylac*	lb.	.93	.95
Guantal*	lb.	.62	.69
Harvex*	lb.	.70	.76
Hepteen Base*	lb.	1.85	1.90
Kure-Blend MT*	lb.	—	.70
Ledate, Rodform*	lb.	—	1.04
MBT-XXX*	lb.	.55	.57
MBTS Pellets*	lb.	.54½	.56½
Merac*	lb.	.75	1.05
Mercaptobenzothiazol	lb.	.44	.46
Mercaptobenzothiazyl Disulfide	lb.	.54	.56
Mertax*	lb.	.55	.62
Methazate*	lb.	—	1.04
Monex*	lb.	—	1.14
Mono Thiurad*	lb.	—	1.14
Morfex*	lb.	.65	.67
2-MT	lb.	.88	.90
NA-22* (for neoprene)	lb.	—	1.05
NOBS No. 1*	lb.	.76	.78
Special*	lb.	.80	.82
O-X-A-F	lb.	.55	.57
Pennac SDB*	lb.	.45	.48
Pentex*	lb.	—	1.24
Flour*	lb.	—	.30
Permalux (Neoprene)*	lb.	—	2.25
Phenex*	lb.	.60	.65
Polyac*	lb.	—	1.85
R-2 Crystals*	lb.	—	4.35
Rotax*	lb.	.55	.57
RZ-50-A*	lb.	—	1.00
B*	lb.	—	1.00
Santocure*	lb.	.76	.83
NS*	lb.	.80	.87
Selenac* (Ethyl, Methyl)	lb.	—	4.25
Seleram, Ethyl	lb.	—	3.00
Setsit-5*	lb.	.75	1.05
9*	lb.	.85	1.15
SPDX-GH*	lb.	.77	.79
GL*	lb.	1.20	1.30
Tellurac*	lb.	—	1.45
Tepidone*	lb.	.45	.48
Tetrone A*	lb.	—	1.98
Thiate A*		.88	—
B*	lb.	1.05	1.25
Thiofide*	lb.	.54	.61
S*	lb.	.64	.71
Thionex*	lb.	—	1.14
Thiotax*	lb.	.44	.51
Thiram, Ethyl	lb.	—	1.04
Methyl	lb.	—	1.14
Thiurad*	lb.	—	1.14
Thiuram E*	lb.	—	1.04
M*	lb.	—	1.14
Trimene*	lb.	.56	.62
Base*	lb.	1.03	1.10
Triphenyl Guanidine	lb.	—	.90
Tuads* (Ethyl)	lb.	—	1.04
Tuads* (Methyl)	lb.	—	1.14
Tuex*	lb.	—	1.14
Ultex*	lb.	1.15	1.20
Unads*	lb.	—	1.14
ZB*, ZE*, ZM*	lb.	—	.85
Vulcacure NB*	lb.	.45	.45
NS*	lb.	.75	1.05
TMD*	lb.	—	1.14
Z-B-X*	lb.	2.45	2.50
Zenite*	lb.	.54	.56
Zenite A*	lb.	.69	.71
Zenite Special*	lb.	.55	.57
Zetax* (uncoated)	lb.	.55	.57
Zimate* (Butyl)	lb.	.85	.89
Zimate* (Ethyl)	lb.	.85	.89
Zimate* (Methyl)	lb.	.85	.89
Ziram, Butyl	lb.	—	1.04
50% Dispersion	lb.	.85	.89
Ziram, Ethyl	lb.	—	1.04
50% Dispersion	lb.	.85	.89
Ziram, Methyl	lb.	—	1.04
50% Dispersion	lb.	.85	.89

ACTIVATORS

Blue Lead Sublimed (dlvd.)	lb.	.17¼	.18¼
Cottonseed Fatty Acids			
Drew Wecoline C*	lb.	.17¾	.19
Wochem 210*	lb.	.16¾	.19¼
211*	lb.	.16¾	.19¼
Fish Oil, Hydrogenated, Fatty Acid			
DAR-S* (dlvd.)	lb.	.12¼	.14¾
DAR-HY* (dlvd.)	lb.	.15½	.18
Hydrofol Acids* (dlvd.)	lb.	.15	.25¼
Hyfac 430* (dlvd.)	lb.	.18	.20½
Neo-Fat H.F.O.* (dlvd.)	lb.	.14½	.15¾
Neutrex* (dlvd.)	lb.	.15½	.18
Stearite*	lb.	.11¾	.14¼
Talene* (dlvd.)	lb.	.16½	.19
Lime, Hydrated			
Arrowhead*	ton	—	21.00
Marblehead*	ton	—	19.25
Sierra*	ton	—	22.50
Litharge			
Eagle-Picher* (c.l.)	lb.	.18	—
SB* (dlvd.)	lb.	—	.18½
Magnesium Oxide, Heavy			
General Magnesite 500*	lb.	.05½	.06
600*	lb.	.06½	.07
Kaiser 325*	lb.	.057	.073
Michigan No. 15*	lb.	.05½	.06½

ACTIVATORS (Cont'd)

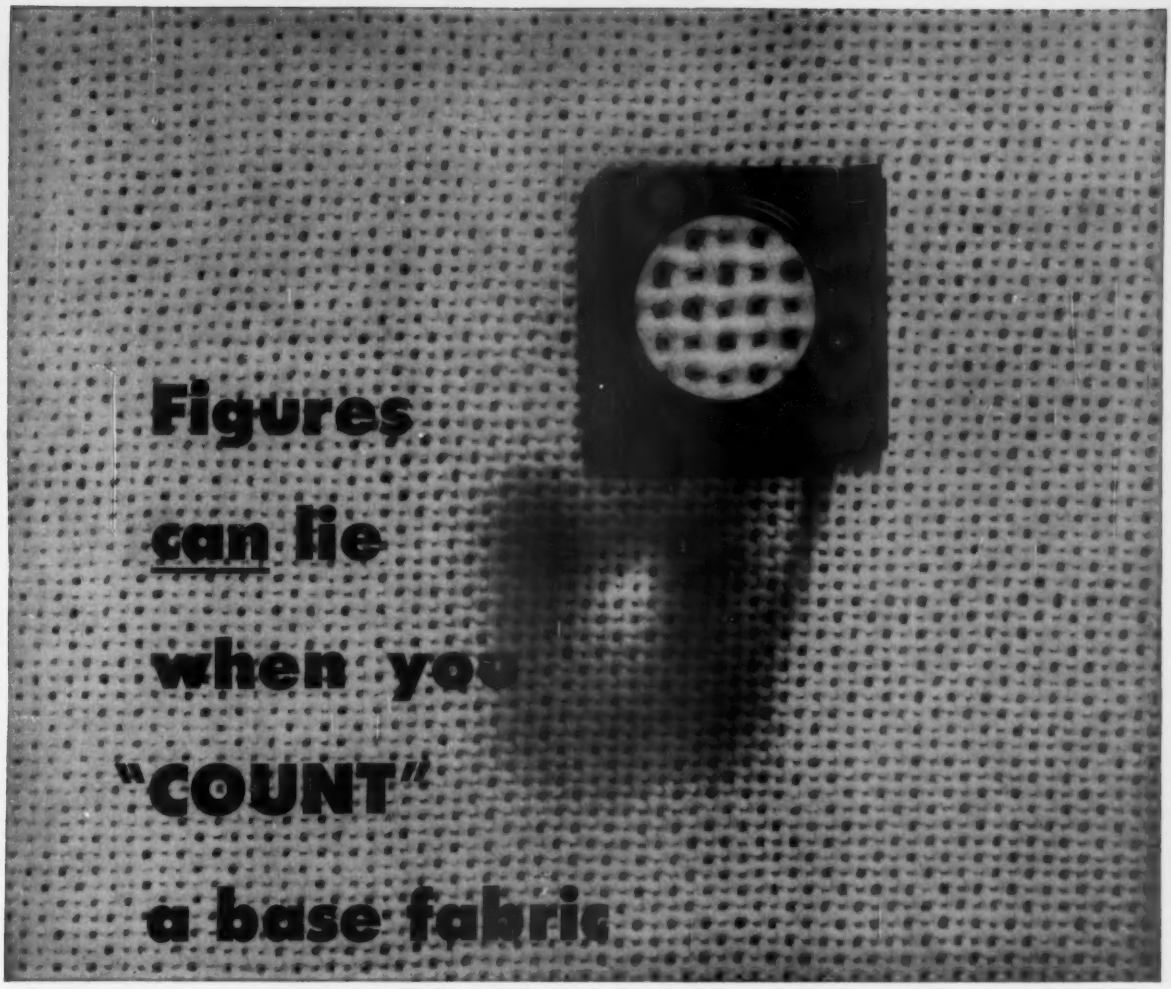
Magnesium Oxide, Light			
Carey Mag*	lb.	.25¼	.26
General Magnesite* (neoprene grade)	lb.	.26¾	.28¾
General Magnesite No. 101*	lb.	.23½	.24½
Genmeg MLW*	lb.	.23½	.24½
K & M* (neoprene grade)	lb.	.29¼	.30
Light Calcined Magnesia			
No. X-01*	lb.	.25¼	.26
Maglite D*	lb.	.23½	.26¼
K*	lb.	.25¾	.28¼
L*	lb.	.29¾	.30½
M*	lb.	.26¾	.30¾
Marmag*	lb.	.22¼	.25
Michigan No. 30*	lb.	.25¼	.26
Neomag Powder*	lb.	.29¼	.30
Pellets*	lb.	.31¼	.32
Michigan No. 40*	lb.	.29¼	.30
Oleic Acid			
Dar-Chem* 105	lb.	.17	.19½
Drew Wecoline OO*	lb.	.17¼	.19
Emersol 210* (dlvd.)	lb.	.17	.19½
Groco Red Oil		.17	.19½
Neo-Fat 92-04*	lb.	.20½	.22½
94-04*	lb.	.18½	.20½
Wochem 310, 311	lb.	.16½	.19
Palm Fatty Acids			
Groco 45*	lb.	.15¾	.18¼
Neo-Fat*	lb.	.15¾	.17¾
Wochem 280*	lb.	.15¾	.18¼
281*	lb.	.16¼	.18¾
Potassium Oleate (dms.)	lb.	.48	.73
Drew 24%*	lb.	.20	.73
Red Lead			
Eagle-Picher* (c.l.)	lb.	.19	—
No. 2 RM* (dlvd.)	lb.	—	.18½
Sodium Laurate, 75%	lb.	.64	.89
Sodium Oleate, 75%	lb.	.54	.79
Paste (dms.)	lb.	.39	.64
Sodium Stearate, 75%	lb.	.47	.72
Stearic Acid, Single Pressed			
Emersol 110* (dlvd.)	lb.	.16	.18½
Groco 53*	lb.	.16	.18½
Neo-Fat 18-53*	lb.	.14¾	.16¾
Standard Pearlstearic* (dlvd.)	lb.	.16	.18½
Wochem 730*	lb.	.13¼	.15¾
Stearic Acid, Double Pressed			
Choice Pearlstearic* (dlvd.)	lb.	.16	.18½
Emersol 120* (dlvd.)	lb.	.16½	.19
Groco 54*	lb.	.16½	.19
Hydrofol Acid 444	lb.	.12¼	.14¾
Neo-Fat 18-54*	lb.	.15¼	.17¾
Wecoline 200*	lb.	.14¾	.16
1000*, 1500*	lb.	.12	.13¼
Wochem 731*	lb.	.15	.17½
Stearic Acid, Other			
Extra Pearlstearic* (dlvd.)	lb.	.17¾	.20¼
Groco*	lb.	.12¼	.14¾
Neo-Fat 18*	lb.	.18½	.20½
18-58*	lb.	.14¼	.16¾
18-61*	lb.	.16¼	.18¾
Stearex* (dlvd.)	lb.	.11¾	.13
Stearite*	lb.	.11¾	.13¼
Wecoline 300*	lb.	.15¼	.16½
Wochem 720*	lb.	.11¼	.13¾
721*	lb.	.11¼	.13¾
732*	lb.	.16	.18½
White Lead Basic Carbonate	lb.	.19	.20
White Lead Basic Sulfate	lb.	.17¼	.18¼
Zinc Laurate			
Laurex*	lb.	.33	.34
Zinc Stearate	lb.	.41	.46
Aquazinc K.C.*	lb.	.30	.55
Crown Brand*	lb.	.39	.44

Unclassified Activators

Actifat* (dms.)	lb.	—	.18
Aktone*	lb.	.21¼	.23¼
Barak*	lb.	—	.65
Curade*	lb.	.57	.59
Dibenzo G-M-F	lb.	—	2.60
D-B-A*	lb.	—	1.95
G-M-F*	lb.	—	2.60
Dibutylamine (dlvd.)	lb.	.55½	.56½
MODX*	lb.	.38	.40
Neo Fat 42-07*	lb.	.10¾	.12¼
Ridacto* (dlvd.)	lb.	.25	.26
Snodotte* (dlvd.)	lb.	.20¼	.22¾
Vimbra	lb.	.32	.38½
Vulklor*	lb.	.88	.98

ANTI-COAGULANTS

Aqua Ammonia* (dms.)	lb.	.031	.035
M.B.M.C.* (l.c.l.)	lb.	.54	.76



Yarns-per-inch "count" of grey fabric can be completely misleading because of changes produced by finishing and subsequent processing!

"Count" tells how open or tight a woven fabric is. The number of yarns per inch of cloth affects absorbency, adhesion, permeability, strength, bulk, flexibility and other characteristics related to fabric-reinforced plastic or rubber products. But if count is taken in the "grey," dimensional changes caused by pre-shrinking, heat-setting, calendering, napping, singeing, pre-dipping or other processes will not have been considered—and end-product performance may suffer.

Of course, thread count is but one of many factors affecting fabric performance. When your base fabric is one of the wide variety provided by Wellington Sears for coating, laminating, combining and rubberizing, you know that everything has been considered in the light of *your specific need*. And moreover you know that a century of experience is working for you, to anticipate and help solve your basic fabric problems. For free booklet, "Fabrics Plus," write Dept.G-10, Wellington Sears Co., 111 W. 40th St., New York 18, N. Y.

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ANTI-FOAMING AGENTS

Aero Anti Foam H*	lb.	——	**.20**
Regular*	lb.	——	.12
Anhydrol 6991*	lb.	.51	.56
D.C. Antifoam A*	lb.	**5.45**	**6.65**
Antifoam A Emulsion*	lb.	2.05	2.85
Antifoam AF Emulsion*	lb.	**2.05**	**2.85**
Antifoam B*	lb.	.68	1.20
Defoama W-1701*	lb.	——	**.12½**
Defoamer A-25*	lb.	——	**3.00**
Defoamer 630*	lb.	——	.14
Deltyl Prime	lb.	**.70**	**.80**
Foam-Nix*	lb.	.50	1.25
G-E Antifoam SS-24*; 66*	lb.	5.28	6.65
60 Emulsion*	lb.	2.05	3.75
Igepol CO-210	lb.	——	.36
Kessco X-3* (dms.)	lb.	——	.39
X-180*	lb.	——	.28
X-181*	lb.	——	.36½
Nopco 1407*	lb.	.19½	.21½
1497-V*	lb.	.14¼	.16¼
1907-B*	lb.	.22½	.24½
JMK*	lb.	.48½	.50½
JMI*	lb.	.23¼	.25¼
JMY*	lb.	.21	.23
Pluronic L61*	lb.	**.33½**	.39
RS-968*	lb.	**.38**	**.38½**
Terpinol Prime No. 1	lb.	**.35**	.50
Tributyl Phosphate (dms.)	lb.	**.52½**	**.53½**
UC SAG 47*	lb.	5.25	6.50
470*	lb.	.69	1.20
VL-520*	lb.	2.68	3.50

ANTIOXIDANTS

Agebest 1293-22A*	lb.	**1.90**	**2.00**
AgeRite Alba*	lb.	2.40	2.50
Gel*	lb.	.70	.72
Hipar*	lb.	1.05	1.07
H.P.*	lb.	.79	.81
Powder*	lb.	.57	.59
Resin*	lb.	.88	.90
Resin D*	lb.	.57	.59
Spar*	lb.	.57	.59
Stalite & Stalite S*	lb.	.57	.59
Superlite*	lb.	.57	.59
White*	lb.	1.50	1.60
Akroflex C*	lb.	.85	.87
CD*	lb.	.79	.81
Alcogard 354*	lb.	1.40	1.52
Aminox*	lb.	.57	.62
Antioxidant 425*	lb.	**2.47**	**2.50**
Antioxidant 2246*	lb.	**1.50**	**1.53**
Antox*	lb.	.59	.61
Aranox*	lb.	3.25	3.30
Benzoquinone	lb.	**1.50**	**1.75**
Betanox Special*	lb.	.91	.96
B-L-E*	lb.	.57	.62
B-X-A*	lb.	.55	.57
Catalin CAO No. 1*	lb.	.91	.95
CAO No. 3*	lb.	1.05	1.07
CAO No. 5*	lb.	1.49	1.50
CAO No. 6*	lb.	——	3.20
Deenax*	lb.	.95	1.05
Di-tert-Butyl-para-Cresol	lb.	.86	1.16
Eugenol C-95%*	lb.	**2.30**	**2.50**
Flectol H*	lb.	.57	.64
Flexamine*	lb.	.79	.84
Ionol* (dms.)	lb.	.91	.95
Neozone A*	lb.	.64	.66
C*	lb.	.86	.88
D*	lb.	.57	.59
Nevastain A*	lb.	.51	.61
B*	lb.	.51	.70
Nullapon BF-12*	lb.	——	.21½
BF-13*	lb.	——	.25½
BF-78*	lb.	——	.55
BF-Acid*	lb.	——	.85
Octamine*	lb.	.57	.62
Oxidex*	lb.	——	3.60
PDA-10*	lb.	.46	.48
Permalux*	lb.	——	2.25
Polygard*	lb.	.52	.62
Santoflex AW*	lb.	.79	.86
DD*	lb.	.57	.64
75*	lb.	1.01	1.08
Santovar-A*	lb.	1.55	1.62
Santowhite Crystals*	lb.	1.55	1.62
Santowhite L*	lb.	.57	.64
MK*	lb.	1.25	1.32
Powder*	lb.	1.55	1.62
Sequestrene AA*	lb.	.70	.80
NA2*	lb.	.59	.66
NA3*	lb.	.58	.65
Stabilite*	lb.	.57	.59
Alba*	lb.	.75	.80
FLX*	lb.	.78	.80
L*	lb.	.65	.67
White*	lb.	.57	.59
White Powder*	lb.	.46	.48
Stabilizer No. 1*	lb.	**1.55**	**1.80**
Stabilizer No. 9-A*	lb.	**.80**	**1.05**
Styphen I*	lb.	**.51**	**.55**
Sunolite*	lb.	**.16**	**.22**
Tecquinol*	lb.	.82½	.84½
Tannic Acid, Tech.	lb.	**.46**	**.48**
Tenamene 3*	lb.	.91	.95
Thermoflex A*	lb.	1.05	1.07
V-G-B*	lb.	.75	.77
Wing-Stay S*	lb.	.53	.57

ANTIOZONANTS

Eastozone* 30, 31	lb.	1.24	1.26
Fura-Tone NC-1008*	lb.	.28	.39
NC-1012*	lb.	.46	.69
UOP 88* & 288* (dms.)	lb.	——	1.07

ANTI-SCORCHING AGENTS

Armeen HT*	lb.	.34	.40
Good-rite Vultrol*	lb.	.67	.70
Harcopol 1183*	lb.	.70	.74
Retarder PD*	lb.	.37	.39
W*	lb.	——	.46
Sodium Acetate 60-62% Crystals	lb.	**.08**	**.08½**

ANTISEPTICS AND GERMICIDES

A.P.C. 6901*	lb.	.32	.38
Arquad S*	lb.	.38	.44
Formaldehyde (dms.)	lb.	.06	.076
G-4* (bbls.)	lb.	1.09	1.29
G-11*	lb.	1.98	2.08
Halane*	lb.	.40	.47
Ortho Cresol (26°—27°)	lb.	.14	.16¼
Preventol GD	lb.	——	1.09
Retarder D*	lb.	**.42**	**.50**
Vancide	lb.	——	.80

ANTI-WEEPING AGENTS (for Latex)

DC 7 Compound*	lb.	5.05	6.50
Webnix 34-L*	lb.	1.25	1.75
57*	lb.	1.50	2.00
69-C*	lb.	1.50	2.00
71*	lb.	1.25	1.75

AROMATICS (DEODORANTS)

Airkem 115*	gal.	——	**6.50**
122*	gal.	——	6.50
186*	gal.	——	6.50
Alamask AA*	lb.	——	3.00
AF*	lb.	——	2.50
AO*	lb.	——	1.50
AR*	lb.	——	.50
BG*	lb.	——	1.15
BGM*	lb.	——	.60
CY*	lb.	——	2.40
DJ*	lb.	——	3.35
DL*	lb.	——	1.95
H*	lb.	——	5.50
LD*	lb.	——	.75
ND*	lb.	——	2.75
O*	lb.	——	6.50
OS*	lb.	——	5.25
Bouquet 149*	lb.	——	3.00
Coumarin*	lb.	——	3.70
Curodex 19*	lb.	**4.75**	**4.90**
188*	lb.	**5.75**	**5.90**
198*	lb.	**6.75**	**6.90**
Deodorant 65*	lb.	——	1.85
Deodorant L-37*	lb.	2.15	2.25
L-44*	lb.	2.65	2.75
N.L.T.X.*	lb.	1.90	2.00
Deodorant Oil GD 6422*	lb.	1.90	2.20
GD 6423*	lb.	1.60	1.90
GD 6575*	lb.	**2.40**	**2.90**
GD 31063*	lb.	**2.25**	**2.75**
Ethavan*	lb.	6.20	6.25
Latex Perfume 17326	lb.	——	4.00
18301	lb.	——	3.00
22258	lb.	——	2.50
Naugaromes* (dms.)	lb.	**.60**	**3.00**
Neutroleum Delta*	lb.	——	2.25
Gamma*	lb.	——	3.25
Parador A*	lb.	1.80	2.10
C*	lb.	2.00	2.50
E*	lb.	.25	.40
GD 5280*	lb.	**2.00**	**2.50**
GD 53481*	lb.	1.70	2.00
Perfume Oil Bouquet Vanilla M*	lb.	1.60	1.70
Rodo No. 0*	lb.	4.00	4.50
No. 10*	lb.	5.00	5.50
Rubbarome* (dms.)	lb.	**.60**	3.80
Rubber Perfume 12*	lb.	——	4.35
Russian Leather 7*	lb.	——	4.35
Vanillin	lb.	2.75	2.80

BLOWING AGENTS

Ammonium Bicarbonate	cwt.	——	**8.00**
Better Blend Soda* (c.l., bags)	cwt.	——	2.55
Blowing Agent No. 81105	lb.	.32	.35
Celogen*	lb.	——	**1.95**
AZ*	lb.	——	**1.95**
Diazo Amino Benzene	lb.	——	.73
Kempore R-125	lb.	——	1.95
Neo Fat 42-12*	lb.	.10¼	.12¼
Opex 40	lb.	——	.76
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	——	2.40
Unicel ND*	lb.	——	.76
S*	lb.	——	.20
Urea	lb.	.06	.07

BONDING AGENTS

Base 6986*	lb.	.27	.32
Braze*	gal.	**6.00**	**9.00**
Chemlok 201, 203, 220, 401, 607	gal.	5.00	24.00
614	lb.	4.35	4.75
Cover Cement*	gal.	**2.50**	**4.00**
Durez 12987*	lb.	.47½	.51½
Gen-Tac Latex*	lb.	.70	.75
Hylene M*	lb.	1.70	2.00
M-50*	lb.	1.00	1.25
Penacolite B1A*	lb.	——	**.95**
R-2710*	lb.	——	**.95**
Pliobond 20*	gal.	2.91	4.23
30*	gal.	3.65	4.97

BONDING AGENTS (Cont'd)

Rex Compounds*	gal.	**1.30**	**1.90**
Thixons*	gal.	**3.30**	**9.00**
Ty-Ply Q (BN & S)*	gal.	**6.75**	**8.00**
Tygobond 30*	gal.	4.10	5.40
40*	gal.	5.80	6.89
41*	gal.	8.65	9.85
45*	gal.	5.75	6.48
Vinculux	gal.	——	4.95

COAGULANTS

Acetic Acid—56% (bbls., cwt.		**9.00**	**11.00**
Glacial 99½% (dms.)	lb.	**.12**	**.13**
Calcium Nitrate, Tech. Flake	lb.	.07½	.09½
Hydroxyacetic Acid—70% (dms.)	lb.	——	.09½
Zinc Nitrate, Tech. Flake	lb.	——	.20

COLORING AGENTS

Black

Aquablak B*	lb.	.09¾	.10¾
M*	lb.	.10½	.11
S*	lb.	.11¾	.12¼
Black Shield 4*	lb.	.09	.09½
No. 5	lb.	.10	.10½
No. 6	lb.	.09	.09½
No. 19	lb.	.11	.11½
L-1404B	lb.	.10½	.11
Carbon Black—See *Reinforcing Agents*			
Cooke 1026*	lb.	——	**2.50**
Lampblack No. 10*	lb.	**.06**	**.09**
Mapico Black Iron Oxide* (50 lb. bags)	lb.	.14¾	.15
Pure Black Iron Oxide	lb.	.14¾	.14½

Blue

Akron Masterbatches*	lb.	2.23	**2.78**
Toners*	lb.	2.30	**6.35**
Blue Powders	lb.	2.20	**3.75**
Cooke M.B. Blue*	lb.	2.20	**3.75**
Disco Blues	lb.	2.20	3.45
Monastral Rubber Blue CPL*	lb.	1.95	1.95
PCD, Dispersed*	lb.	——	2.55
Peacoline Blue*	lb.	——	**3.85**
Ramapo Blue*	lb.	2.75	**3.00**
Rubber Blue GD* (Disp.)	lb.	——	**4.75**
Rubber Blue X-1999*	lb.	——	**1.90**
Rubber Dispersed Blues	lb.	**2.52**	**2.78**
Solfast Blue*	lb.	.75	3.60
Stan-Tone MBS*	lb.	2.20	2.85
GPE*	lb.	——	1.50
PEC*	lb.	.93	1.08
Ultramarine	lb.	**.14**	**.30**
Vansul Blue M.B.*	lb.	1.00	2.60

Brown

Brown Iron Oxide	lb.	.15¼	.15½
Mapico Brown* (50 lb. bags)	lb.	.15¾	.16
Stan-Tone GPE*	lb.	——	**3.00**
Vansul Brown M.B.* (Organic)	lb.	——	2.30

Green

Akron Masterbatches*	lb.	1.38	3.08
Toners*	lb.	1.35	**4.95**
Cooke M.B. Green*	lb.	1.60	2.80
1013*	lb.	——	**2.80**
Disco Greens	lb.	1.55	2.80
Green Powders	lb.	**1.35**	**3.95**
Monastral Rubber Green GSD* (Dispersed)	lb.	——	2.80
GSL*	lb.	2.20	2.20
Permansa Green CP-1236*	lb.	——	1.35
Pigment Green B*	lb.	1.45	1.45
GL-652D*	lb.	.90	.95
Ramapo Green*	lb.	——	**3.50**
Rubber Dispersed Greens	lb.	**1.23**	**3.08**
Rubber Green FD* (Disp.)	lb.	——	**2.05**
Rubber Green X-1292*	lb.	——	1.75
Solfast Green*	lb.	——	**3.95**
Stan-Tone MBS*	lb.	**1.55**	**3.35**
GPE*	lb.	——	3.00
PC*	lb.	2.20	2.25
Vansul Green M.B.*	lb.	1.50	3.00

Maroon

Akron Masterbatches*	lb.	——	4.10
Toners*	lb.	2.00	**4.00**
Pyrolux Maroon*	lb.	——	3.40
Vansul Maroon M.B.*	lb.	——	3.35

Orange

Akron Masterbatches*	lb.	2.42	2.77
Toners*	lb.	2.82	**4.00**
Benzidene Orange	lb.	——	3.30
Cooke MB*	lb.	2.25	2.35
1021*	lb.	——	2.25
Dianisidine Orange*	lb.	——	2.85
Disco Oranges	lb.	2.30	2.85
Mercadium X-2667*	lb.	——	1.61
Molybdate Orange	lb.	——	.48
Oswego Orange X2065*	lb.	——	**3.15**
Rubber Orange OD* (Disp.)	lb.	——	**2.25**
Stan-Tone Cadmium Dry*	lb.	1.85	4.23
Cadmium Paste*	lb.	2.48	2.80
GPE*	lb.	1.20	**4.35**
PC*	lb.	.75	.80
Vansul Orange M.B.*	lb.	2.40	**2.45**

A NEW DIAMOND DEVELOPMENT...

ANNOUNCING CARBIUM

a new precipitated calcium carbonate for faster, easier, low-cost processing

CARBIUM is a new dense precipitated calcium carbonate developed by Diamond for use in highly loaded compounds where low modulus is desired. It can speed up processing and cut your costs.

CARBIUM can be employed in very high loadings (as high as 300 parts to 100 parts of rubber), while maintaining a fast mixing cycle with low heat build-up. Gives good dispersion and good color stability in light-colored items.

Physical Properties of Carbium

Linseed Oil Absorption, cc/100 grams	30-35
Packed Density, lbs./cu. ft.	66-73
Specific Gravity	2.65
Color	White
Particle Size, microns	1-10

Write today for full information. Ask Diamond's technical service group for any assistance you need in the application of Diamond Chemicals. Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

COLORING AGENTS (Cont'd)

Red

Akron Masterbatches*	lb.	1.00	3.53
Toners*	lb.	.86	3.00
Arcturus Reds*	lb.	—	1.35
Antimony Trisulfide	lb.	.72	.78
R.M.P. Sulfur Free*	lb.	—	.78
R.M.P. No. 3*	lb.	—	.72
Brilliant Toning Reds*	lb.	1.65	1.90
Cadmolith Red* (dms.)	lb.	1.94	2.87
Cooke M.B. Red*	lb.	1.05	3.25
1010*	lb.	—	1.75
Disco Reds	lb.	1.05	3.25
Graphic Red* (dlvd.)	lb.	.98	1.03
Kroma Reds*	lb.	.14	.15
Lake Red C*	lb.	—	1.25
Mapico Reds* (50 lb. bags)	lb.	.14¼	.14½
Mercadium X-2668 Light*	lb.	—	1.68
X-2669 Medium Light*	lb.	—	1.76
X-2670 Medium*	lb.	—	1.83
X-2671 Dark*	lb.	—	1.91
Oximony Red Iron Oxide	lb.	.12¼	.13
Polaris Red*	lb.	—	1.70
Recco Red Oxide*	lb.	.12	.13
Red Iron Oxide, Light	lb.	.13¼	.14
Red Powders	lb.	—	4.40
Rubber Dispersed Reds	lb.	1.47	3.58
Rubber Red PBD* (Disp.)	lb.	—	2.05
2BD, Dispersed*	lb.	—	2.00
2BL*	lb.	1.24	1.24
PBL*	lb.	1.24	1.24
Rubanox Reds*	lb.	1.47	1.60
Rubber Red CP-339* (dlvd.)	lb.	—	1.10
Rubber Red X-1148*	lb.	—	.93
Solfast Red*	lb.	1.47	1.80
Stan-Tone MBS*	lb.	1.00	3.75
GPE*	lb.	.77	3.15
PC*	lb.	1.30	2.50
PDS*	lb.	1.40	1.55
PVC*	lb.	1.63	1.90
Vansul Red M.B.*	lb.	1.05	3.35
Watchung Red*	lb.	1.90	1.90

Tan

Mapico Tan 15* (50 lb. bags)	lb.	.23¼	.23½
20* (50 lb. bags)	lb.	.23¼	.23½

White—Lithopone

Eagle-Picher*	lb.	.0800	.0975
Permolith*	lb.	.0837½	.0912½
Sunolith*	lb.	.0800	.0875

White—Titanium Pigments

Iceberg*	lb.	—	.02½
Icecap K*	lb.	—	.03¼
Horse Head Anatase Grades*	lb.	.25½	.26½
Rutile Grades*	lb.	.27½	.28½
Stan-Tone PC*	lb.	.55	.60
Ti-Cal*	lb.	.09	.09¼
R-22*, R-25*, R-27*, R-30*	lb.	.09⅜	.09⅞
R-60*	lb.	.09⅜	.10⅛
Ti-Pure*	lb.	.24½	.27½
Anatase Grades*	lb.	.25½	.26½
R-100*, R-500*	lb.	.27½	.28½
Titanox A*—all grades (dlvd.)	lb.	.25½	.26½
C-50* (dlvd.)	lb.	.14⅜	.14⅞
RA* (dlvd.)	lb.	.27½	.28½
RA-10* (dlvd.)	lb.	.27½	.28½
RA-NC* (dlvd.)	lb.	.27½	.28½
RC* (dlvd.)	lb.	.09⅜	.10⅛
RC-HT* (dlvd.)	lb.	.09⅜	.09⅞
Unitane O-110*	lb.	.25½	.26½
O-220*	lb.	.25½	.26½
O-310*	lb.	.25½	.26½
O-410*	lb.	.25½	.26½
OR-150*	lb.	.27½	.28½
OR-250*	lb.	.27½	.28½
OR-340*	lb.	.27½	.28½
OR-342*	lb.	.27½	.28½
OR-350*	lb.	.27½	.28½
OR-540*	lb.	.27½	.28½
OR-640*	lb.	.27½	.28½
Zopaque*	lb.	.24½	.25½
R*	lb.	.26½	.27½

White—Zinc Oxide (American Process)

AZODOX 44, 45	lb.	.1450	.1550
AZO-ZZZ 11*, 22*, 33*, 44*, 55*	lb.	.1450	.1550
Eagle-Picher AAA*	lb.	.1450	.1550
Horse Head Special*	lb.	.1450	.1550
XX*	lb.	.1450	.1550
Protox 166*	lb.	.1450	.1550
167*	lb.	.1450	.1550
267* (pelleted)	lb.	.1450	.1550
St. Joe Black Label*	lb.	.1450	.1550
Green Label*	lb.	.1450	.1550
Red Label*	lb.	.1450	.1550
Pelleted	lb.	.1450	.1550

COLORING AGENTS (Cont'd)

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	—	.13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.1450	.1550
Florence Green Seal*	lb.	.1625	.1725
Red Seal*	lb.	.1575	.1675
White Seal*	lb.	.1675	.1775
Kadox 25*	lb.	.1675	.1775
15*, 17*, 72* & 515*	lb.	.1450	.1550
Protox 168*	lb.	.1450	.1550
169*	lb.	.1450	.1550
268* (pelleted)	lb.	.1450	.1550
U.S.P. (cartons)	lb.	.1775	.1875
XX-78*	lb.	.1450	.1550

White—Zinc Sulfide

Cryptone ZS*	lb.	.2530	.2630
Lehigh 35%*	lb.	.15125	.16125
50%	lb.	.15375	.16375

Yellow

Akron Masterbatch*	lb.	1.12	2.18
Toners*	lb.	2.10	6.00
Benzidene-Lightfast	lb.	3.40	5.35
Benzidine Yellow	lb.	1.41	2.55
Cadmolith Yellow (dms.)	lb.	1.12	1.20
Chrome Yellow	lb.	.35	.35
Cooke M.B. Yellow 405*	lb.	2.15	2.75
105*	lb.	—	2.15
Disco Yellows	lb.	2.05	3.95
Iron Oxide, Pure Light Shades	lb.	.12	.12¼
Dark Shades	lb.	.11½	.11¾
Mapico Yellow* (50 lb. bags)	lb.	.12	.12¼
Rubber Dispersed Yellows	lb.	1.27	2.13
Rubber Yellow GD* (disp.)	lb.	—	2.25
GL*	lb.	—	1.68
Rubber Yellow X-1940*	lb.	—	2.35
Stan-Tone Cadmium Dry*	lb.	2.80	2.98
Cadmium Paste	lb.	1.77	1.79
MBS*	lb.	1.30	2.20
GPE*	lb.	.77	3.25
PC*	lb.	.55	3.40
Toluidine Yellow	lb.	2.20	2.20
YL-660 D*	lb.	1.25	1.35
Oximony Iron Oxide	lb.	.12¼	.13
Vansul Yellow M.B.*	lb.	1.15	2.15
Yellow Powders	lb.	2.00	5.00
Zinc Yellow	lb.	.29	.29

DISPERSING AGENTS

Anchoid*(†)	lb.	.24	.25
Anhydrapent*	lb.	.56	.57
Armeen 18*	lb.	.39	.45
Belloid TD*	lb.	.15¾	.16¼
Blancol*	lb.	—	.15¾
Darvan No. 1*, No. 2*, No. 3*	lb.	.22	.30
Daxad 11* (21*, 23*)	lb.	.08	.30
Diethanolamine (dms., dlvd.)	lb.	.24½	.27
Dispersaid*	lb.	1.25	1.35
Emcol K-8300* (dms.)	lb.	.14	.18
P10-59	lb.	.32	—
5120	lb.	.31	—
5138	lb.	.31	—
Emulphor ON-870*	lb.	—	.55
Furala*	lb.	.06½	.07½
Halloid*	lb.	.04½	.05½
Igepal CO-630*	lb.	—	.29
Igepon T-73*	lb.	—	.29½
Kyro EO* (dms.)	lb.	—	.29¾
Leonil SA*	lb.	—	.55
Lipal No. 9-N*	lb.	.28	.29
11-O*	lb.	.28	.29
Lomar PW*	lb.	.15¼	.15¾
Marasperse C*	lb.	.06¼	.06¾
CB*	lb.	.13	.15
N*	lb.	.09½	.10½
Monoethanolamine (dms., dlvd.)	lb.	.25	.27½
Naccotan A*	lb.	.16½	.17
Nekal BA-75*	lb.	—	.40
BX-78*	lb.	—	.64
Nopco 1187-X*	lb.	.15	.16
Pluronic F68*	lb.	.38½	.44
Polyfon*	lb.	.08	.10
R & R 551*	lb.	—	.28
Rubbex*	lb.	.247	.277
Stablex B*	lb.	.50	.95
Stan-Chem BQC*	lb.	.12¼	.17¼
1067*	lb.	—	.13½
1471*	lb.	.1687	.2187
2251*	lb.	.12¼	.17¼
Trenamine D-25*	lb.	.32½	.36
Triethanolamine (dms., dlvd.)	lb.	.22	.25½
Yelkin TT* (and TTS*)	lb.	.13	.16

EXTENDERS

Arco 1071-13B*	lb.	.14½	.15½
1073-18B*	lb.	.13½	.14½
1294-36B*	lb.	.11½	.12½
Car-Bel Ex-A* (and B*)	lb.	—	.14
Extender 600*	lb.	—	.1870
Facile Gum 4A*	lb.	.48	.50
Millex*	lb.	—	.07
W*	lb.	—	.07

EXTENDERS (Cont'd)

Nopco 2271*	lb.	.16¾	.18¾
Polyco 418*	lb.	.17	.18
PR-162 Latex Extender*	lb.	—	.182
Solvitose HDF*	lb.	.22	.25
Synprolac*	lb.	.16	.23
Synprowax*	lb.	—	.23
Vistanex MM Grades*	lb.	—	.35

FILLERS (Inert and Reinforcing)

Abrasives Carbonite*	lb.	.21½	1.35
Lionite*	lb.	.16	1.27
Pumice*	lb.	.03	.05
Walnut Shell Grits	ton	60.00	110.00
Aluminum Hydrate	lb.	.031	.170
Kaiser Alumina*	lb.	.026	.059
Aluminum Silicate AFD*	ton	29.50	36.00
Aluminum Flake*	ton	29.50	36.00
Marter White*	ton	18.50	30.00
Barium Carbonate (l.c.l.)	ton	109.00	126.50
Barytes No. 1 Floated, White*	ton	55.00	79.85
No. 2 Floated, Unbleached*	ton	50.00	74.85
No. 22 Barytes* (c.l.)	ton	—	30.00
No. 3805 Barytes*	ton	22.00	26.75
Foam A*	ton	—	55.00
Sparmite*	ton	80.00	90.00
XIOR*	ton	80.00	90.00
Bentonite (c.l.)	ton	—	13.50
Argosite Clay* (c.l.)	ton	—	12.50
Bennett Clay* (c.l.)	ton	—	32.50
SPV Volclay* (c.l.)	ton	—	13.50
White Hi-Gel*	ton	—	65.90
Blanc Fixe	ton	125.00	142.00
Calcium Carbonate Atomite* (c.l.)	ton	—	32.50
B.I. White No. 1 (c.l. ton	ton	—	10.00
Calcene NC*	ton	80.00	100.00
TM*	ton	82.50	102.50
Calwhite*	ton	—	20.00
Camel-Carb*	ton	—	14.00
Camel-Tex*	ton	—	22.00
Camel-Wite*	ton	—	35.00
CCO White*	ton	—	22.00
Duramite*	ton	—	20.00
Gamaco* (c.l.)	ton	—	32.50
Georgia Marble 5-25* (c.l.)	ton	—	20.00
No. 10 White* (c.l.)	ton	—	11.00
Kalite*	ton	52.50	67.50
Laminar*	ton	—	30.00
Lesamite* (c.l.)	ton	—	27.50
Lorite*	ton	30.00	36.00
Millical*	ton	38.00	53.00
Multifex MM*	ton	117.50	137.50
Non-Fer-Al*	ton	35.00	50.00
Purecal M*	ton	56.75	80.75
SC* (and T*)	ton	110.00	125.00
U*	ton	120.00	135.00
PPTD* (c.l.)	ton	—	30.00
Rambo No. 1*	ton	—	11.50
Snowflake*	ton	—	20.00
Super Multifex*	ton	167.50	187.50
Surfex*	ton	42.00	57.00
Suspenso*	ton	38.00	43.00
Witcarb Reg.*	ton	60.00	85.00
*	ton	117.50	140.00
R*	ton	127.50	150.00
RC*	ton	117.50	140.00
York White*	ton	—	11.50
Calcium Silicate Silene EF*	lb.	.55	.65
Calcium Sulfate, Anhydrous Snow White Filler*	ton	—	22.00
Calcium Sulfate Hydrous Terra Alba No. 1*	ton	—	17.00
Chalk Whiting (l.c.l.)	lb.	.01½	.01¾
Recco Paris Whiting*	ton	—	35.00
OMYA Whiting*	ton	—	30.00
Clay Afton Clay*	ton	13.00	38.00
Aiken Clay*	ton	14.50	—
Alsilite* (c.l.)	ton	30.00	45.00
Aluminum Flake*	ton	25.50	28.50
Buca* (c.l.)	ton	—	45.00
Burgess No. 20*	ton	—	35.00
No. 30*	ton	—	37.00
Burgess Iceberg*	ton	—	50.00
Icecap K*	ton	—	65.00
Catalpo* (c.l.)	ton	—	35.00
Champion*	ton	—	14.50
Crown*	ton	—	14.00
Dixie* (c.l.)	ton	—	14.50
Franklin Clay—R* (c.l.)	ton	16.00	41.50
G. K. Soft*	ton	11.00	28.00
Hardwick Clays*	ton	20.00	57.00
Hi-White R*	ton	14.50	—
Kaolloid Clay* (c.l.)	ton	—	10.50
LGB*	ton	17.50	22.50
LGP*	ton	20.00	25.00
McNamee* (c.l.)	ton	—	14.50
Natka 1200 (c.l.)	ton	—	13.00
Par* (c.l.)	ton	—	13.00
Paragon*	ton	14.50	19.50
Pigment 5*	ton	27.50	34.50
33*	ton	—	37.00
Recco* (c.l.)	ton	—	14.50
Swanee Clay*	ton	—	12.50
Snobrite*	ton	—	12.50
Suprex*	ton	14.50	19.50
Whitetex* (c.l.)	ton	—	50.00
Windsor*	ton	14.50	39.50
4200 Clay*	ton	13.00	—

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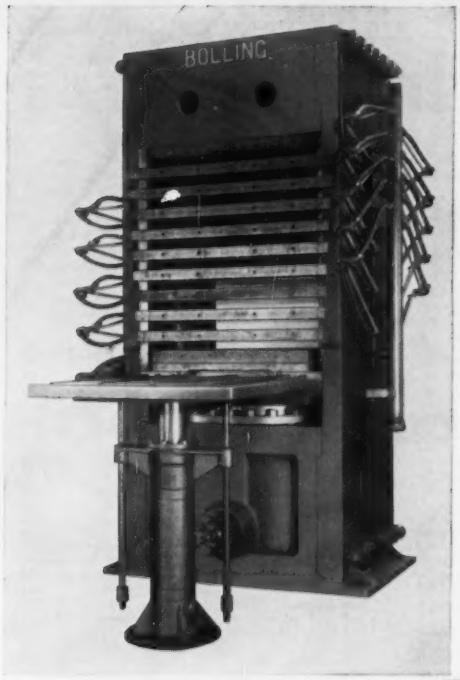

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Meet close tolerances with a Bolling slabside press. Bolling slabside design places strength where needed in order to avoid deflection and assure the highest percentage of usable production. Bolling slabside presses are available from 20″x20″ through 48″x48″. The tonnage span is from 100 to 1250. Bolling also designs and builds a complete range of 4-bolt presses, full- and semi-ring presses, hydraulic pumping units and lift tables.

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FILLERS (Cont'd)

Diatomaceous Earth	ton	30.00	- 50.00
Celite 270	ton	55.00	-121.00
292	ton	36.00	- 95.00
Kaylorite* (c.l.)	ton	—	- 30.00
Lorite*	ton	—	- 36.00
Flock			
Cotton (White)	lb.	.26	- .28
Colored	lb.	.12	- .26
Filfloc F 40-9000*	lb.	—	- .13
F 6000*	lb.	—	- .36
Polycel*	ton	110.00	-210.00
Rayon, Bleached or Dyed	lb.	.75	- 1.20
Rayon, Grey	lb.	—	- .18
Rayon, Pink	lb.	—	- .20
Solka-Floc* (l.c.l.)	lb.	.07	- .16
Glue, Amber	lb.	.17	- .19
Ground Softwood Bark			
Silvacon* (c.l.)	ton	55.00	-100.00
Leather			
Flour (dust)	lb.	.12	- .15
Shredded	lb.	.05	- .17
Lignin	lb.	.06	- .08
Indulin*	lb.	.06	- .08
Limestone, Pulverized	ton	3.00	- 5.00
Asbestol Regular*	ton	27.00	- 29.00
Asbestol Superfine*	ton	32.00	- 34.00
Georgia Marble No. 10*	ton	—	- 11.00
Industrial Filler No. 100*	ton	—	- 7.75
Micro Velva A*	ton	49.00	- 51.00
L*	ton	57.00	- 59.00
No. 1 White*	ton	—	- 11.00
Magnesium Carbonate	lb.	.10½	- .13
K & M Clearcarb*	lb.	—	- .14
Technical* (c.l., cwld.)	lb.	.10½	- .12
Marinco CL*	lb.	—	- .1
Magnesium Silicate (see Talc)			
Mica	lb.	.01¼	- .07¼
Concord*	lb.	.08	- .08¾
Micro-Mica*	lb.	.08	- .08¾
Mineralite* (c.l.)	ton	40.00	- 85.00
Silversheen*	lb.	.08	- .08¾
Triple A Mica* (c.l.)	ton	—	- 35.00
Vermiculite*	lb.	—	- .11
Wet Ground Biotite Mica	lb.	.06½	- .07¼
Wet Ground Mica No. 160*	lb.	.08	- .08¾
Pecan Shell Flour Stan Shell*	ton	45.00	- 75.00
Pyrophyllite			
No. 261*	ton	—	- 11.50
Pyrax A* (c.l.)	ton	14.50	- 15.00
WA* (c.l.)	ton	17.00	- 17.50
Sawdust, Graded	ton	14.00	- 35.00
Silica	ton	16.00	- 27.00
Extra Fine (bags) (c.l.)	ton	—	- 43.00
Slate, Powdered (l.c.l.)	ton	15.00	- 20.00
Lo-Micron Slate Flour*	lb.	—	- .04½
No. 133 Slate Flour*	ton	—	- 4.55
Sodium Silico Aluminate Zeolex 23*	lb.	.06	- .07
Talc (Magnesium Silicate)			
Asbestol Regular*	ton	—	- 27.00
Eastern RC-500*	ton	—	- 32.00
No. 41*	ton	—	- 19.70
No. 549*	ton	—	- 63.00
French*	ton	—	- 59.00
No. 367*	ton	—	- 13.00
No. 1600*	ton	—	- 70.60
No. 1768*	ton	—	- 13.00
Nytal 200* (c.l.)	ton	—	- 28.00
300* (c.l.)	ton	—	- 38.00
Sierra Fibrene C-400*	ton	33.00	- 38.00
Sierra Supreme 325*	ton	48.75	- 57.25
Sierra White*	ton	20.75	- 31.75
Soapstone*	ton	—	- 13.00
Walnut Shell Flour	ton	55.00	-100.00
Agrashell*	ton	55.00	-115.00
Stan-Shell*	ton	50.00	-100.00
Whiting, Commercial	ton	—	- 7.50
Allied Whiting*	ton	10.50	- 21.50
Camel-Carb*	ton	—	- 10.00
Calwhite (c.l.)	ton	—	- 20.00
C-C-O White*	ton	—	- 22.00
Georgia Marble No. 15*	ton	—	- 20.00
No. 16*	ton	—	- 20.00
Piqua No. 1 YAA* (c.l.)	ton	10.00	- 10.00
No. 2 LS* (c.l.)	ton	10.00	- 10.00
Snowflake* (c.l.)	ton	—	- 20.00
Stan-White 325*	ton	11.50	- 14.10
Ultrasil*	lb.	.35	- .50
Veroc* (c.l.)	ton	—	- 11.50
Welco* (c.l.)	ton	—	- 10.50
York White R* (c.l.)	ton	—	- 11.00
Wood Flour	ton	31.50	- 48.00

FINISHING MATERIALS, SURFACE

Beaco Finishes*	gal.	2.10	- 2.35
Black Out*	gal.	4.50	- 8.00
Shellac, Orange Gum	lb.	.40	- .50
VanWax*	gal.	1.45	- 1.50

FLAME RETARDANTS

Cellulfex CEF* (dms.)	lb.	—	- .65
Chlorowax 40*	lb.	.15¼	- .17¼
50*	lb.	.16¾	- .17¾
70*	lb.	.18½	- .20
Halowax*	lb.	.36	- .46
Zinc Borate 3167*	lb.	.1920	- .2020
Zyrox Compounds*	lb.	.38	- .95½

LATEX MODIFIERS

Ludox	lb.	.15	- .16¼
OPD-101*	lb.	.29	- .36
Piccopale A-1 Emulsion	lb.	.086	- .113
Ubatol U-2001* (t.c.)	lb.	.166	- .187
U-2003* (t.c.)	lb.	.184	- .208
U-2007* (t.c.)	lb.	.166	- .187
U-3025* (c.l.)	lb.	.223	- .235
U-3040* (c.l.)	lb.	.260	- .272
U-3045* (c.l.)	lb.	.260	- .272
U-3050* (c.l.)	lb.	.195	- .207

LUBRICANTS, MOLD

Akro Gel*	lb.	—	- .165
Alipal CO-433*	lb.	—	- .20
CO-436*	lb.	—	- .24
Aluminum Stearate Crown Brand*	lb.	.37	- .42
Amine, Mixed Crude*	lb.	.19	- .25
Aquadag*	lb.	3.50	- 4.00
Aquarex D*	lb.	—	- .78
L*	lb.	—	- .94
ME*	lb.	—	- .80
MDL*	lb.	—	- .33
WAQ*	lb.	—	- .20
Armeen HT*	lb.	.34	- .40
180*	lb.	.52	- .56
Armid HT (flaked)*	lb.	.42	- .46
0*	lb.	.39	- .41
Borax, Granular (l.c.l.)	ton	89.00	- 94.00
Carbowax 4000*	lb.	.31	- .32
CD Mold Release B*	gal.	5.00	- —
B-2*	gal.	5.00	- —
Colite Concentrate* (dms.)	gal.	.90	- 1.15
Colite D43D*	gal.	1.15	- 1.40
Concentrex*	lb.	—	- .25
Dag Dispersions No. 197*	lb.	1.85	- 2.90
D.C. 7 Compound*	lb.	5.05	- 6.50
D.C. Emulsion No. 7*	lb.	1.59	- 2.07
No. 8*	lb.	1.20	- 1.74
No. 35*	lb.	1.20	- 1.74
No. 35A*	lb.	1.20	- 1.74
No. 35B*	lb.	1.20	- 1.74
No. 36*	lb.	1.20	- 1.74
D.C. Mold Release Fluid*	lb.	3.04	- 3.61
Dri-Lube*	lb.	—	- .22
Emulsion Lubricant A80*	lb.	—	- 1.20
45*	lb.	—	- 1.20
G-E Silicone Emulsion SM-55*	lb.	1.18	- 1.74
SM-61*	lb.	1.18	- 1.74
SM-62*	lb.	1.18	- 1.74
G-E Silicone Fluid SF-92*	lb.	3.04	- 4.25
SF-96*	lb.	3.04	- 4.25
Hawkeye Flake* (dlvd.)	lb.	.15	- .15¾
HSC No. 35*	lb.	1.22	- 2.46
No. 515	lb.	1.22	- 2.46
Igepal CO-430*	lb.	—	- .29
CO-630*	lb.	—	- .29
CO-530*	lb.	—	- .29
Igepon AP-78*	lb.	—	- .48
T-33*	lb.	—	- .21
T-51*	lb.	—	- .13½
Kokobace R*	lb.	.17½	- .18½
Lipal 9-N*	lb.	.28	- .29
7-O*	lb.	.29	- .30
Lubrex	lb.	.25	- .30
Lubri-Flo*	gal.	10.00	- 12.00
Migralube*	lb.	—	- .35
ML-1027-2C*	gal.	—	- 2.65
ML-1028-2C*	gal.	—	- 2.65
Mold Lubricant No. 72 Conc.* (dms.)	gal.	—	- 1.90
Mold Lubricant No. 735* (dms.)	gal.	—	- 1.25
No. 769* (dms.)	gal.	—	- 1.20
No. 825* (dms.)	gal.	—	- 2.00
No. 856* (dms.)	gal.	—	- 1.90
No. 880* (dms.)	gal.	—	- 1.19
No. 887* (dms.)	gal.	—	- 1.80
No. 935* (dms.)	gal.	—	- 1.56
No. 956* (dms.)	gal.	—	- 2.50
No. 965* (dms.)	gal.	—	- 2.15
No. 967* (dms.)	gal.	—	- 2.40
No. 969* (dms.)	gal.	—	- 1.50
No. 975* (dms.)	gal.	—	- 2.85
No. 980* (dms.)	gal.	—	- 1.53
No. 987* (dms.)	gal.	—	- 2.45
A 187* (dms.)	gal.	—	- 1.90
A 256* (dms.)	gal.	—	- 1.20
A 988* (dms.)	gal.	—	- 2.60
Moldeze No. 3*	gal.	—	- 4.95
Mold-Brite*	gal.	—	- 1.50
Monopole Oil MD*	lb.	—	- .16
MR-22 Silicone Semi-Permanent	gal.	9.95	- 14.95
Olate Flakes*	lb.	.23½	- .24¾
Orvus WA Paste* (dms.)	lb.	—	- .23¼
Plaskon Polyethylene S*	lb.	.32	- .47
Poly-Brite PE-20	lb.	.28	- .42
600	lb.	.42	- .58
Poly-Cone 125X	lb.	1.20	- 1.40
1,000	lb.	.93	- 1.06
Polyglycol 15-200*	lb.	.25	- .28¾
E4000*	lb.	.31	- .37
Prodag*	lb.	.30	- .52
Purity Flake* (dlvd.)	lb.	.18¾	- .19¾
Rubber-Flo*	gal.	1.25	- 2.00
Rubber-Glo*	gal.	—	- .94
Rusco Mold Paste*	lb.	—	- .25
Sericite* (l.c.l.)	ton	65.00	- 75.00
Silicone Oil A145*	lb.	3.22	- 3.61
A220* (dms.)	lb.	—	- 2.80
Silrex (dms.)	lb.	—	- .65
A65*	lb.	2.50	- 2.75

LUBRICANTS, MOLD (Cont'd)

Soybean Lecithin	lb.	.13	- .17
Thermalube*	lb.	—	- .13¾
UC Silicone L-45*	lb.	3.04	- 4.75
L-522*	lb.	2.68	- 3.50
LE-45*	lb.	1.20	- 1.70
LE-450*	lb.	1.20	- 1.70
Ucon Lubricants*	lb.	.26¼	- .27¾
Ulco Mold Soap*	lb.	.19	- .29

LUBRICANTS, RUBBER

Diglycol Stearate Neutral (and SE) (dms.)	lb.	—	- .25
Extrud-o-Lube*	gal.	1.33	- 1.54
G.B. Naphthenic Neutrals*	gal.	.11	- .18
Ivory Chips*	lb.	.19¼	- .20¾
Latex-Lube GR* (dlvd.)	lb.	.19¼	- .20
No. 82-A* (450 lb. dms.)	lb.	—	- .08½
Propylene Stearate (dms.)	lb.	.35	- .60

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.41	- .46
Calcium Stearate	lb.	.39	- .44
Crown Brand*	lb.	.37	- .42
D.C. 7 Compound*	lb.	5.05	- 6.50
D.C. 200 Fluid*	lb.	3.04	- 3.61
ELA*	lb.	—	- .82
G-E Silicone Fluid SF-92*	lb.	3.04	- 4.25
Glycerized Lubricant*	gal.	1.25	- 1.40
Glydag B*	lb.	1.50	- 2.10
Glyso-Lube* (dms.)	lb.	—	- .14
No. 3* (dms.)	lb.	—	- .14
HSC No. 35*	lb.	1.28	- 1.34
No. 515*	lb.	1.28	- 1.34
Hydro-Zinc*	lb.	—	- .20
Latex-Lube Pigmented* (dlvd.)	lb.	.17¼	- .18¼
R-66*	lb.	—	- .16½
Liqui-Lube* (dlvd.)	lb.	—	- .16¾
N.F.* (dlvd.)	lb.	—	- .16¾
N.T.* (dlvd.)	lb.	—	- .16¾
Lubrex*	lb.	.25	- .30
Lubri-Cote	gal.	.86	- 1.00
Magnesium Stearate	lb.	.42	- .47
Crown Brand*	lb.	.40	- .45
Polyethylene Glycol	lb.	.22	- .26
Rubber Free (Concentrate)*	gal.	—	- 1.44
Jel*	lb.	.18	- .21½
Separex*	lb.	—	- .10½
Slab-Dip* (dms.)	lb.	—	- .17
Soybean Lecithin	lb.	.13	- .17
Stock-Lube*	lb.	—	- .19
UC XL-42*	lb.	3.14	- 4.75
XLE-42*	lb.	1.22	- 1.70
XLE-420*	lb.	1.22	- 1.70
Zinc Stearate	lb.	.41	- .46

MOLD CLEANERS

Actusol* (dlvd.)	gal.	1.45	- 1.65
Alkon* (dlvd.)	lb.	.16	- .16½
CA-301*	gal.	—	- 2.49
CA-302*	gal.	—	- 2.63
G-O 6910*	lb.	.38	- .40
Metso Anhydrous*	cwt.	5.70	- 7.95
Metso 99*	cwt.	5.00	- 7.25
200*	cwt.	6.70	- 8.95
Granular*	cwt.	4.45	- 6.70
Orvus Extra Granules*	lb.	.23¼	- .24¼
Polo*	lb.	.12¾	- —
Rubber-Sol*	gal.	2.97	- 3.97
Shelblast*	lb.	.04	- .08¼
Sprex A.C.* (dlvd.)	lb.	.17¾	- .18¾
Zip Mold Cleaner*	gal.	1.05	- 1.55

PEPTIZING AGENTS

Peptizer P-12*	lb.	.95	- 1.25
Pepton 22 Plasticizer*	lb.	.83	- .86
65*	lb.	1.23	- 1.26
65B*	lb.	.83	- .86
Pitt-Consol 620, 640	lb.	.37	- .42
RPA 2*	lb.	—	- .85
3*	lb.	—	- .51
3 Conc.*	lb.	—	- .85
5*	lb.	—	- 1.10
6*	lb.	—	- 1.66

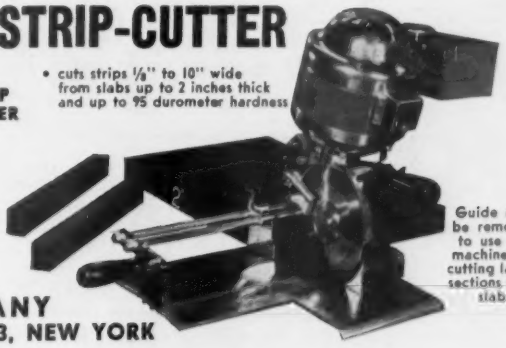
PLASTICIZERS & SOFTENERS

Acto 500*	lb.	—	- .09
Adipol BCA*	lb.	.45	- .45½
2EH*	lb.	.42½	- .43½
10A*	lb.	.42½	- .43½
ODY*	lb.	.45½	- .46½
810*	lb.	.42¼	- .45¼
XX*	lb.	.42½	- .43½
Admex 562 (dms.)	lb.	.50¼	- .51¼
710 (dms.)	lb.	.35¼	- .36¼
711 (dms.)	lb.	.37¼	- .38¼
744 & 745 (dms.)	lb.	.41¼	- .42¼
760 (dms.)	lb.	.59¼	- .60¼
761 (dms.)	lb.	.46¼	- .47¼

New!— a HEAVY-DUTY PORTABLE **RUBBER STRIP-CUTTER**

EASTMAN MODEL **RS-75** STRIP CUTTER

• cuts strips 1/8" to 10" wide from slabs up to 2 inches thick and up to 95 durometer hardness



Guide may be removed to use the machine for cutting larger sections from slabs.

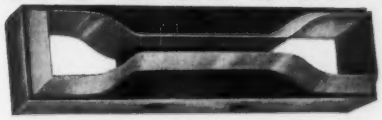
This newly developed strip-cutter, powered by a compact one-horsepower motor, makes it simple and easy to cut perfectly square strips within .010". Blade edge and gauge are continually moistened for easy cutting. Knife is automatically sharpened while cutting. Many other fine features. Care to try this Eastman?

Skivers, Straight-Knife and regular Round-Knife machines also available. Send for Circular. Representatives everywhere

EASTMAN MACHINE COMPANY
CLeveland 5768 BUFFALO 3, NEW YORK

HOGGSON TOOLS, MOLDS, DIES

For Rubber Testing and Production



"DUMBELL" Test Strip Die D412(SIT)

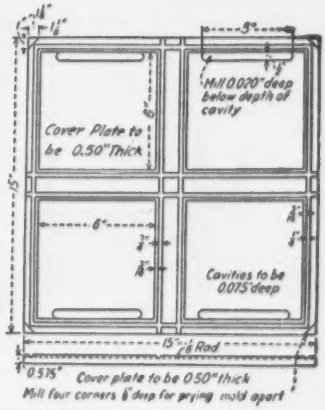
BENCH MARKER

1" and 2" Centers

MALLET HANDLE DUMBELL DIE

For making tensile test samples, we make many types of slab molds. One is detailed at the right. These are plain or chrome finished. We usually stock molds for making adhesion, abrasion, flexing, compression and rebound test samples, but supply special molds promptly. We also furnish hand-forged tensile dies for cutting regular or tear test samples.

SLAB MOLD D15-55


Mill 0.020" deep below depth of cavity
Cover Plate to be 0.50" Thick
Cavities to be 0.075" deep
0.515"
Cover plate to be 0.50" thick
Mill four corners 6" deep for prying mold apart

HOGGSON & PETTIS MFG. CO., 141A Brewery St., New Haven 7, Conn.
Pac. Coast: H. M. Royal, Inc., Downey, Calif.

STOP! HAVING RUBBER HOLLAND PROBLEMS. BRATEX USERS NEVER HAVE THEM!

HOLLISTON

BRATEX RUBBER HOLLAND

You'll be adding up extra profits for yourself with the time and money you save by using Bratex. It's always pliable, either in hot or cold processing, and its clean peeling features save time and work. You'll find it easier to use because it is non-flaking and never loses its outstanding surface gloss. Available in 20" or 40" widths, 100 and 250 yard rolls, or made up to your own specifications.

THE **HOLLISTON MILLS,** INC. NORWOOD, MASS

NEW YORK • CHICAGO • PHILADELPHIA • MILWAUKEE • SAN FRANCISCO

PLASTICIZERS & SOFTENERS (Cont'd)

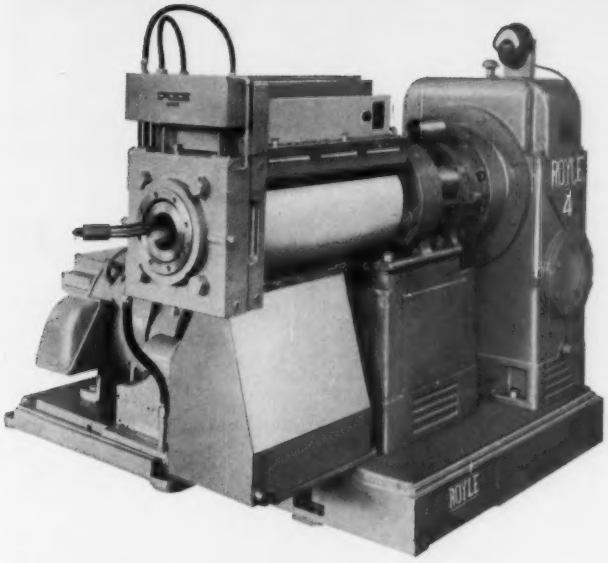
Anhydrol 6990*	lb.	.51	.56
Arneel SD*	lb.	.34	.40
Arolene 1980* (c.l.)	lb.	—	.10
Aromatic Plasticizer 10* (and 25*) (dms.)	lb.	.06	.07½
Aromatic Tar	gal.	.0573	.1973
Bardol*	lb.	.02¼	.03¾
B*	lb.	.06¼	.06½
Bayol D*	gal.	—	.382
F*	gal.	—	.52
Bearflex 1751*	lb.	.15	.18½
Beeswax, Bleached	lb.	.73	.75
Yellow Refined	lb.	.64	.65
Bondogen*	lb.	.55½	.60½
B.R.C. No. 20*	lb.	.0150	.0175
No. 21*	lb.	.02¼	.03
No. 22*	lb.	.02½	.02¾
B.R.H. 2*	lb.	.0213	.0351
BRS 700*	lb.	.0200	.0285
B.K.T. 3*	lb.	.0180	.0265
4*	lb.	.0250	.0269
7*	lb.	.0300	.0310
B.R.V.*	lb.	.0475	.0565
Bunarex Resins*	lb.	.07	.08
Bunatak AH*	lb.	—	.09½
N*	lb.	—	.31
U*	lb.	—	.17½
No. 90*	lb.	—	.09
No. 210*	lb.	—	.14
Butac*	lb.	.12½	.13½
Butyl Carbitol Periargonate (dms.)	lb.	—	.64½
Butyl Cellosolve Periargonate (dms.)	lb.	—	.68
Butyl Oleate	lb.	.25½	.26½
Butyl Palmitate	lb.	—	.26½
Butyl Stearate (dms.)	lb.	.22¼	.25¼
Califlux 510* (and 550*)	lb.	.02¼	.03¼
G.P.*	lb.	.01½	.02½
R-100*	lb.	.04¼	.05¼
TT*	lb.	.0195	.0295
Candelilla Wax, Prime	lb.	.53	.64
Refined Light	lb.	.56	.57
Carbowax 4000* (dms.)	lb.	.68	.70
Cardolite NC-103*	lb.	.36	.59
Carnauba Wax, Crude	lb.	.72	.74
Flaked	lb.	.73	1.25
Refined, Technical	lb.	.73	.74
Refined, Pure	lb.	.80	.88
Yellow	lb.	1.22	1.26
Celluflex* (dms.)			
112* (t.c., dlvd.)	lb.	—	.32½
179-A* (t.c., dlvd.)	lb.	—	.32½
179-C* (t.c., dlvd.)	lb.	—	.32½
179-EG* (t.c., dlvd.)	lb.	—	.32½
DBP* (t.c., dlvd.)	lb.	—	.30
DOP* (t.c., dlvd.)	lb.	—	.28½
TPP* (dms., eqld.)	lb.	—	.40
Ceresin Wax	lb.	.12	.30
Chlorowax 40*	lb.	.15¼	.17½
50*	lb.	.16¾	.17¾
70*	lb.	.18½	.20
LV*	lb.	.17¼	.19¾
CTLA Polymer*	gal.	.20	.36
Cumar Resins*	lb.	.07	.19
Darex DBM*	lb.	.30½	.34
DBP*	lb.	.30	.33½
DOP*	lb.	.30½	.33½
DIOP*	lb.	.30½	.33½
D.B.M.*	lb.	.32	.34¾
Decylbutyl Phthalate	lb.	.27	.29½
Degras, Common	lb.	—	.14
Diallyl Phthalate	lb.	.51½	.52½
Dibenzyl Sebacate (dms.)	lb.	.93	.93½
Dibutoxyethyl Sebacate	lb.	—	.56¾
Dibutyl Phthalate (dms.)	lb.	.32½	.33½
Dibutyl Sebacate	lb.	.67½	.68
Dicapryl Adipate (dms.)	lb.	.41½	.42½
Dicapryl Phthalate (dms.)	lb.	.29	.30
Dicapryl Sebacate	lb.	.58	.59½
Di-Carbitol Phthalate (dms.)	lb.	.49	.49½
Dicyclohexyl Phthalate	lb.	.58¼	.59¼
Diethyl Phthalate (dms.)	lb.	.31½	.32½
Di-2-ethylhexyl Phthalate (dms.)	lb.	.30½	.31½
Dihexyl Adipate (dms.)	lb.	.46½	.47½
Dihexyl Phthalate (dms.)	lb.	.32½	.33½
Dihexyl Sebacate (dms.)	lb.	.66	.66½
Diisobutyl Azelate	lb.	—	.47¼
Di-iso-octyl Adipate	lb.	.42½	.43½
Dimethyl Phthalate (dms.)	lb.	.32	.33
Dimethyl Phthalate	lb.	.32	.33
Dimethyl Sebacate (dms.)	lb.	1.30	1.30½
Dinonyl Adipate	lb.	.44½	.47½
Dinopol 235*	lb.	.36	.37
IDO*	lb.	.31	.32
MOP*	lb.	.31½	.32½
Dioctyl Adipate (dms.)	lb.	.42½	.43½
Dioctyl Phthalate (dms.)	lb.	.30½	.31½
Dioctyl Sebacate (dms.)	lb.	.61¼	.61¾
D.I.O.P. (dms.)	lb.	.30½	.31½
Dipolymer Oil	gal.	.33	.48
Dispersing Oil No. 10*	lb.	.06	.06¼
Dutrex* 1, 6, 7	gal.	.18	.23
6H	gal.	.13	—
15E	gal.	.11	.23
20, 25	lb.	.03	.06
33	gal.	.21	.33
Elastex 10-P*	lb.	.30½	.33½
50-B*	lb.	.25	.28
DCHP*	lb.	.59	.60
Emulphor EL-719*	lb.	—	.58
Epoxy Plasticizer	lb.	.33½	.36
Drapex 3.2*	lb.	.39¼	.40¼
Drapex 4.4*	lb.	.34¾	.35¾
Drapex 7.7*	lb.	.37	.38

PLASTICIZERS & SOFTENERS (Cont'd)

Esparto Wax	lb.	—	.55
Estac*	lb.	—	.16
Facile Gum 4A*	lb.	.48	.50
Flexol B-400*	lb.	.27½	.28½
DOP*	lb.	.30½	.31½
TOF*	lb.	.45½	.46½
3GH*	lb.	.46	.46¾
3GO*	lb.	.55	.55¾
4GO*	lb.	.35	.36
426*	lb.	.29½	.30½
Flexricin P-1*	lb.	.33½	.36½
P-4*	lb.	.30½	.33¼
P-6*	lb.	.37	.40
P-8*	lb.	.30¼	.33¼
Fortex A* (dms.)	lb.	.12½	.14½
Fura-Tone NC-1008*	lb.	.28	.39
Galex W-100*	lb.	.15½	.19½
G.B. Asphaltic Flux*	gal.	.0970	.1770
G.B. Light Process Oil*	lb.	.02¾	.03¾
Medium Process Oil*	lb.	.03¾	.04¾
G.B. Naphthenic Neutrals*	gal.	.12½	.21½
Good-rite GP233*	lb.	.40	.43½
GP235*	lb.	.40	.43½
GP236*	lb.	.40	.43½
GP261*	lb.	.28	.31½
GP265*	lb.	.28½	.32
GP266*	lb.	.29	.32½
GP-266-B[2]A*	lb.	.29	.32½
Halico C-255-NS*	gal.	.27½	.29½
C-566*	lb.	.11	.13
Harflex 300* (dms.)	lb.	.60½	.61½
325* (dms.)	lb.	.45	.46
375* (dms.)	lb.	.76	.77
500* (dms.)	lb.	.34	.35
HB20*	lb.	.15	.17
HB40*	lb.	.21	.22
Herron-H.T.*	gal.	.16	.27
Herron-Plas*	lb.	—	.03¾
Herron-Wax*	lb.	.05¼	.06
No. 23*	lb.	.08¼	.08¾
No. 24*	lb.	.07¼	.07¾
HSC No. 13*	lb.	.25	.32
No. 28 and 38*	lb.	.20	.27
Indonex 632½* (633½*, 634½*, 637½*)	gal.	.12	.19
Isooctyl Decyl Phthalate (dms.)	lb.	.31	.32
Kapsol*	lb.	.35	.35½
Kenflex A & N*	lb.	.19	.34
Kesscoflex BCL* (dms.)	lb.	—	.37
BCO* (dms.)	lb.	—	.33
BCP* (dms.)	lb.	—	.36
BCS* (dms.)	lb.	—	.32
BO* (dms.)	lb.	—	.28¼
BS* (dms.)	lb.	—	.27½
DBT* (dms.)	lb.	—	.68
DIOA* (dms.)	lb.	—	.43½
DOA* (dms.)	lb.	—	.43½
MCO* (dms.)	lb.	—	.35½
MCP* (dms.)	lb.	—	.41
MCS* (dms.)	lb.	—	.35
TRA* (dms.)	lb	—	.40
KP 23*	lb.	.31½	.32½
90*	lb.	.42½	.43½
140*	lb.	.48	.48½
201*	lb.	.58	.59
220* & 260*	lb.	.35½	.36½
666*	lb.	.59½	.60
Kremol 40*	gal.	.36	.46
50*	gal.	.39	.49
Kronisol* (dms.)	lb.	.33	.36
Kronitex AA* (dms.)	lb.	.35	.36
I* (dms.) and K-3*	lb.	.35	.36
MX*	lb.	.35	.36
Lanolin, Tech. Anhydrous	lb.	—	.26
Latex-Lube G.R.*	lb.	.19¼	.20
Lead Oleate	lb.	—	.29¾
Lindol* (dms., t.c.)	lb.	—	.32½
Locusol No. 1-6980*	lb.	.30	.34
2-Mercaptoethanol (dms.)	lb.	1.25	1.50
Methox*	lb.	.40½	.41
Methyl Laurate	lb.	.25	.27
Methyl Oleate	lb.	—	.20
Methyl Stearate (dms.)	lb.	—	.30
Monoplex DOS*	lb.	.59½	.60½
DBS*	lb.	.65½	.66½
S-70*	lb.	.41	.42
S-71*	lb.	.46½	.47½
Montan Wax, Crude	lb.	.22	.29
Flaked	lb.	.29	.29
Morflex*	lb.	.32	.69½
Natac*	lb.	.12	.13
Nebony Resins* (dms.)	lb.	.04½	.05
Neolene 210* (t.c.)	lb.	—	.16
212* (t.c.)	lb.	—	.14
220* (t.c.)	lb.	—	.15
Nerium*	lb.	—	.09
Nevillac Resins* (dms.)	lb.	.31	.85
Neville LX-880* (dms.)	lb.	.12	.13½
LX-685* (dms.)	lb.	.12½	.17½
Neville Resins* (dms.)	lb.	.07¼	.20
Nevindene Resins* (dms.)	lb.	.16¼	.20
Nevinol* (dms.)	lb.	—	.24
Nuba 1* (and 2*) (dms.)	lb.	.06¼	.06¾
No. 480 Oil Proof Resin*	lb.	—	.18
Ohopex Q10* (dms.)	lb.	.30½	.31½
R9* (dms.)	lb.	.37¼	.37¾
Ortho-Nitrobiphenyl	lb.	.13	.15
Ozokerite Wax, White and Yellow	lb.	.24	.31
Paradene Resins (dms.)	lb.	.07¼	.08
No. 2 Flaked	lb.	.08	.08½
Para Flux* (dms.)	gal.	.22	.25
2016* (dms.)	gal.	.22	.26
Para Lube* (l.c.l.)	lb.	.046	.048

PLASTICIZERS & SOFTENERS (Cont'd)

Paraplex G-25*	lb.	.76	.77
G-40*	lb.	.50	.51
G-50*	lb.	.40¾	.41¾
G-53*	lb.	.45	.46
G-60* (and G-61*)	lb.	.35	.36
G-62*	lb.	.37	.38
Parmo*	lb.	.06	.13½
PG-16*	lb.	—	.35
Philrich-5* (t.c.)	gal.	—	.12½
Picco 10* (and 25*)	lb.	.15	.15½
60* (and 75*)	lb.	.14½	.15
100*	lb.	.14½	.17
Piccocizer 30*	lb.	.05½	.07
Piccolastic A* (B*, C*, D* & E*)	lb.	.24	.25
FT* (FHX* & FX*)	lb.	.1695	.1745
T-135*	lb.	.19	.20
Piccolyte S Resins*	lb.	.20½	.23½
Piccopale Resins*	lb.	.12	.13
Piccoumaron Resins*	lb.	.07	.24½
Pigmentar* Pigmentaroil*	lb.	.0460	.0634
Plastac M*	lb.	—	.09¼
Plasticizer 2286*	lb.	—	.26¼
Plasticizer 4141*	lb.	.42½	.43½
Plasticizer DP-200, DP-250.			
DP-520*	lb.	.45	.45¾
DP-316*	lb.	.32¾	.33½
DP-317*	lb.	.46	.47¼
DP-8732*	lb.	.44¾	.46
Plasticizer LP*	lb.	—	.07
Plasticizer MP*	lb.	—	.08
Plasticizer MT-511*	lb.	—	.68¾
Plasticizer ODN*	lb.	.35	.41
Plasticizer SC*	lb.	.42½	.43½
Plasticizer W-13*	lb.	.37	.38¾
Plastoflex 3*	lb.	—	.52
52*	lb.	.37¾	.38¼
VS*	lb.	.41¾	.42¾
Plastogen*	lb.	.08¾	.09
Plastolein 9050* (c.l.)	lb.	.54½	.56½
9055*	lb.	.30½	.32½
9058*	lb.	.48	.50
9250*	lb.	.38¼	.40¼
9715*	lb.	.39	.40
Plastone	lb.	.23	.27
Polycizer 162*	lb.	.28	.31½
332*	lb.	.29	.32½
562*	lb.	.28½	.32
662*	lb.	.29	.43½
532 and 632*	lb.	.40	.41¾
ED*	lb.	—	.51
Polyco 438*	lb.	.34	.35
Polymel C-130*	lb.	.13¾	.14¾
D*	lb.	.22½	.23½
6*	lb.	.05¾	.07¾
Poly-Sperse AP-2	lb.	.23	.29½
AP-300, LC-20	lb.	.26	.32½
Poly-Sperse R-100	lb.	.17	.23½
Process Oil C-255* (c.l.)	gal.	.27½	.29½
Propylene Stearate (dms.)	lb.	—	.32
PRR 1*	gal.	.15	.35
PT 101 Pine Tar Oil* (t.c., dms.)	lb.	.0380	.0554
400 Pine Tar* (600* & 800*) (t.c., dms.)	lb.	.0380	.0554
PX-104*	lb.	.30	.32½
PX-108*	lb.	.30½	.33
PX-138*	lb.	.32½	.33½
PX-208*	lb.	.44½	.45½
PX-238*	lb.	.44½	.45½
PX-404*	lb.	.66	.67
PX-438*	lb.	.60	.61
PX-800*	lb.	.34	.35
PX-917*	lb.	.36½	.37½
Reogen*	lb.	.14¼	.14½
465 Resin* (dms.)	lb.	.07½	.08
Resin C*	lb.	.0225	.0310
Resinex*	lb.	.03¾	.05¼
L-4*	lb.	.02¼	.03¾
Rexflex*	lb.	—	.15
Rosin Oil	gal.	.80	1.35
RR-10 (Neoprene)*	lb.	—	.37
R.S.O. Softening Oil*	lb.	.03	.05
RuBars*	lb.	.19¼	.20
Rubberol*	lb.	.18	.25¾
Santicizer B-16*	lb.	.48¾	.49¾
E-15*	lb.	.54	.55
M-17*	lb.	.46	.47
No. 140*	lb.	.35	.36
No. 141*	lb.	.36	.37
No. 160*	lb.	.29	.30
No. 602*	lb.	—	.28½
No. 603*	lb.	—	.27
Sherolatum*	lb.	.03½	.06
Staflex DBES*	lb.	.58	.60½
DOS*	lb.	.58	.60½
IXA*	lb.	.32	.35
KA*	lb.	.36	.38¾
Stan Chlor Oils*	lb.	.13½	.20½
70*	lb.	.17½	.30
Stanolind Petrolatum*	lb.	.07	.156
Wax*	lb.	.31	.33
Sunny South Burgundy Pitch*	lb.	.1030	.1085
Rosin Oil*	gal.	.58	.76
Superla Wax*	lb.	.30	.397
Syncera Wax*	lb.	.16	.267
Syn Tac* (c.l.)	gal.	—	.33
Synthetic Revertant Oil*	lb.	—	.16
Tar, Refined	gal.	.1200	.1760
Tarpine	lb.	.035	.050
Terpene A*	gal.	—	.65
Tetraflex R-122*	lb.	.27	.30½
TP-90B*	lb.	.59	.69
TP-95*	lb.	.65	.75
Transphalt Resins*	lb.	.03¾	.05¼
Tributyl Phosphate	lb.	.52½	.53½



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PLASTICIZERS & SOFTENERS (Cont'd)

Tricresyl Phosphate	lb.	.32½ -	.36
Turgum S*	lb.	.10¾ -	.11¼
Turgum SB*	lb.	.06¾ -	.07¼
Turpol NC-1200*	lb.	.67 -	.70
NC-1300*	lb.	— -	.50
Vanadiset B*	lb.	.036 -	.07
C*	lb.	.031 -	.06
MR 80 Mesh*	lb.	.08½ -	.12½
Vistac No. 1*	gal.	1.00 -	1.21
P*	lb.	.18 -	.18½
Vopcolene 50*	lb.	— -	.31
Witcizer 100*	lb.	.26 -	.27
200*	lb.	.22¼ -	.25¼
300*	lb.	.30 -	.33⅓
312*, 313*	lb.	.28 -	.31½
412*	lb.	.42½ -	.46

PROCESSING AIDS

Castor Oil, Blown (dms.)	lb.	.26½ -	.27½
Refined (dms.)	lb.	— -	.18½
Castorwax*	lb.	.25 -	.31
Dutrex 7*	lb.	.12 -	.20
ELA*	lb.	— -	.82
Hydrofol Glycerides 200*	lb.	.15½ -	.19¼
Kenflex N*	lb.	.19 -	.26
Maleic Anhydride	lb.	— -	.27
Millrex*	lb.	— -	.15
Nadic Anhydride	lb.	— -	.75
Polycin*	lb.	— -	.24½
Resin No. 510*	lb.	.19 -	.26
No. 529*	lb.	.25 -	.32
Pulverized*	lb.	.20½ -	.25
Thiomalic Acid	lb.	— -	3.50
Zyrox*	lb.	.78 -	.88

PROTECTIVE & STABILIZING AGENTS

Acacia*	lb.	.12¾ -	.21
Alcogum*	lb.	.08½ -	.24
Alpha Protein	lb.	— -	.23
Aroostoocrat*	lb.	— -	.07½
Carob Bean Flour	lb.	— -	.50
Casein	lb.	.22 -	.35
Emcol K-8300* (dms.)	lb.	.14 -	.18
Ethylene Diamine 68%	lb.	.44 -	.47
Gum Arabic	lb.	— -	.23
Karaya Gum	lb.	— -	.35
Locust Bean Gum	lb.	— -	.50
Prosein*	lb.	— -	.06
Stablex B*	lb.	.50 -	.95
K*	lb.	.27 -	.35

RECLAIMING AGENTS

Amalgamator Z-4*	lb.	.34 -	.35
Armeen C*	lb.	.46 -	.52
Mixed Crude*	lb.	.19 -	.25
T*	lb.	.32 -	.38
Burco RA*	lb.	.05 -	.081
BWH-1*	gal.	.17 -	.18
C-6 Oil* (28° & 32°)	gal.	.33 -	.38
C-10 Oil*	gal.	.25 -	.30
C-33* (t.c.)	gal.	— -	.21½
C-42* (t.c.)	gal.	— -	.23
Caustic Soda—Flake 76% (c.l., dms.)	cwt.	— -	4.50
Liquid 50% (t.c.)	cwt.	— -	2.80
Solid 76% (c.l., dms.)	cwt.	— -	4.10
Cresylic Acid (99-100%)	gal.	.85 -	1.39
D-4* (t.c.)	gal.	— -	.27
E-5* (t.c.)	gal.	— -	.25
Flake Calcium Chloride (77-80%)	ton	— -	29.00
G.B. Reclaiming Oil*	gal.	.13½ -	.21½
CD-10*	gal.	.11½ -	.19½
CD-50-U*	gal.	.19½ -	.27½
Gensol No. 6* (t.c.)	gal.	— -	.42
Heavy Aromatic Naphtha	gal.	.13¼ -	.18½
LX-77 Reclaiming Solvent*	gal.	.21 -	.33
LX-572 Reclaiming Oil*	gal.	.27 -	.32
LX-777 Reclaiming Oil*	gal.	.23 -	.33
Neo-Fat D-242*	lb.	.05½ -	.07¼
42-70*	lb.	.08¼ -	.10½
No. 517 H.B. Oil*	gal.	.11½ -	.16½
535*	gal.	.22 -	.27
Nucom* (t.c.)	gal.	— -	.42
Pitt-Consol "500" (dms.)	lb.	.30 -	.30½
PT 101 Pine Tar Oil* (t.c., dms.)	lb.	.0380 -	.0554
Q Oil* (t.c.)	gal.	— -	.286
Reclaiming Oil 3186-G*	gal.	.26 -	.33
Reclaiming Reagent No. 1431*	lb.	.21 -	.25
R.P.A. No. 3*	lb.	— -	.51
RR-10*	lb.	— -	.37
Soda Ash (c.l., bags)	cwt.	— -	1.75
Solvent 534*	gal.	.20½ -	.26½
Solvent Oil 21*	gal.	.24 -	.29
C-42*	gal.	.23 -	.38
X-1 Resinous Oil*	lb.	.0225 -	.0325
701 Oil*	gal.	.27 -	.29

REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98*	lb.	.0775 -	.1450
Continental F*	lb.	.0775 -	.1450
Croflex*	lb.	.0775 -	.1450
Dixiedensed (and 'S)*	lb.	.0775 -	.1450
Kosmobile (and S)*	lb.	.0775 -	.1450
Micronex HPC*	lb.	.0775 -	.1450
Witco No. 6*	lb.	.0775 -	.1450

REINFORCING AGENTS—CARBON BLACK (Cont'd)

Channel, Medium Processing (MPC) (bags)

Arrow MPC*	lb.	.0775 -	.1350
Atlantic MPC-95*	lb.	.0775 -	.1450
Continental A*	lb.	.0775 -	.1450
Croflex TH*	lb.	.0775 -	.1450
Dixiedensed HR (and S-66)	lb.	.0775 -	.1450
Kosmobile HM (and S-66)	lb.	.0775 -	.1450
Micronex Standard*	lb.	.0775 -	.1450
Spheron 6*	lb.	.0775 -	.1450
Texas M*	lb.	.0775 -	.1450
Witco No. 1*	lb.	.0775 -	.1450

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42*	lb.	.0775 -	.1450
Collocarb*	lb.	.0590 -	.1400
Continental AA*	lb.	.0775 -	.1450
Croflex 77*	lb.	.0775 -	.1450
Dixiedensed 77*	lb.	.0775 -	.1450
Kosmobile 77*	lb.	.0775 -	.1450
Micronex W-6*	lb.	.0775 -	.1450
Spheron 9*	lb.	.0775 -	.1450
Texas E*	lb.	.0775 -	.1450
Witco No. 12*	lb.	.0775 -	.1450
Wyex EPC*	lb.	.0775 -	.1350

Channel, Conductive (CC) (bags)

Continental R-40*	lb.	.2600 -	.3400
Dixie 5 Dustless*	lb.	.1350 -	.2100
Dixie Voltex*	lb.	.2600 -	.3400
Kosmink Dustless*	lb.	.1350 -	.2100
Kosmos Voltex*	lb.	.2600 -	.3400
Spheron C*	lb.	.1800 -	.2400
Voltex*	lb.	.2600 -	.3400

Channel, Surface Treated (STC) (bags)

Texas 109*	lb.	.0840 -	.1475

Conductive Furnace Black (CF) (bags)

Aromex CF*	lb.	.0875 -	.1450
Atlantic CF*	lb.	.0925 -	.1500
Continex CF*	lb.	.1050 -	.1550
Croflex CF*	lb.	.0925 -	.1500
Dixie CF*	lb.	.0925 -	.1500
Kosmos CF*	lb.	.0925 -	.1500
Shawinigan Acetylene Black*	lb.	— -	.1900
Vulcan C*	lb.	.1100 -	.1750

Extra-Conductive Furnace Black (ECF) (bags)

Vulcan XC-72 (pellets)*	lb.	.2500 -	.3300

Furnace, Fast Extruding (FEF) (bags)

Arovel FEF*	lb.	.0675 -	.1250
Atlantic 125*	lb.	.0675 -	.1250
Continex FEF*	lb.	.0675 -	.1250
Croflex 50*	lb.	.0675 -	.1250
Dixie 50*	lb.	.0675 -	.1250
Kosmos 50*	lb.	.0675 -	.1250
Philblack A*	lb.	.$675 -	.1250
Statex M*	lb.	.0675 -	.1250
Sterling SO*	lb.	.0675 -	.1250

Furnace, Fine (FF) (bags)

Statex B*	lb.	.0725 -	.1300
Sterling 99*	lb.	.0725 -	.1300

Furnace, General Purpose (GPF) (bags)

Arogen GPF*	lb.	.0600 -	.1175
Atlantic 118*	lb.	.0600 -	.1175
Croflex 35*	lb.	.0600 -	.1175
Dixie 35*	lb.	.0600 -	.1175
Kosmos 35*	lb.	.0600 -	.1175
Statex G*	lb.	.0600 -	.1175
Sterling V*	lb.	.0600 -	.1175
V (Non-Staining)	lb.	.0600 -	.1175

Furnace, High Abrasion (HAF) (bags)

Aromex HAF*	lb.	.0775 -	.1350
Atlantic 130*	lb.	.0775 -	.1350
Continex HAF*	lb.	.0775 -	.1350
Croflex 60*	lb.	.0775 -	.1350
Dixie 60*	lb.	.0775 -	.1350
Kosmos 60*	lb.	.0775 -	.1350
Philblack O*	lb.	.0775 -	.1350
Statex R*	lb.	.0775 -	.1350
Vulcan 3*	lb.	.0775 -	.1350

Furnace, High Modulus (HMF) (bags)

Atlantic 120*	lb.	.0625 -	.1200
Continex HMF*	lb.	.0675 -	.1200
Croflex 40*	lb.	.0625 -	.1200
Dixie 40*	lb.	.0625 -	.1200
Kosmos 40*	lb.	.0625 -	.1200
Modulex HMF*	lb.	.0625 -	.1200
Statex 93*	lb.	.0625 -	.1200
Sterling L*	lb.	.0625 -	.1200
LL*	lb.	.0625 -	.1200

REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, Semi-Reinforcing (SRF) (bags)

Atlantic 115*	lb.	.0575 -	.1175
Continex SRF*	lb.	.0575 -	.1150
Croflex 20*	lb.	.0575 -	.1150
Dixie 20*	lb.	.0575 -	.1150
Essex SRF*	lb.	.0575 -	.1150
Furnex*	lb.	.0575 -	.1150
Gastex*	lb.	.0625 -	.1250
Kosmos 20*	lb.	.0575 -	.1150
Pelletex*	lb.	.0575 -	.1150
NS*	lb.	.0575 -	.1150
Shawinigan Acetylene Black*	lb.	— -	.1900
Sterling NS*	lb.	.0575 -	.1150
R*	lb.	.0625 -	.1250
S*	lb.	.0575 -	.1150

Furnace Super Abrasion (SAF) (bags)

Atlantic 150*	lb.	.1150 -	.1650
Croflex 85*	lb.	.1150 -	.1650
Dixie 85	lb.	.1150 -	.1650
Kosmos 85	lb.	.1150 -	.1650
Philblack E*	lb.	.1150 -	.1725
Statex 160*	lb.	.1150 -	.1800
Vulcan 9*	lb.	.1150 -	.1800

Furnace, Super Abrasion, Intermediate (ISAF) (bags)

Aromex ISAF*	lb.	.0925 -	.1500
Atlantic 135*	lb.	.0925 -	.1500
Continex ISAF*	lb.	.0925 -	.1500
Croflex 70*	lb.	.0925 -	.1500
Dixie 70*	lb.	.0925 -	.1500
Kosmos 70*	lb.	.0925 -	.1500
Philblack I*	lb.	.0925 -	.1500
Statex 125*	lb.	.0925 -	.1500
Vulcan 6*	lb.	.0925 -	.1500

Furnace, Super Conductive (SCF) (bags)

Conductex SC*	lb.	.1150 -	.1800
Vulcan SC*	lb.	.1800 -	.2450

Thermal, Fine (FT) (bags)

P-33 (c.l.)*	lb.	— -	.0575
Sterling FT (c.l.)*	lb.	— -	.0575

Thermal, Medium (MT) (bags)

Shellblack*(†)	lb.	— -	.0250
Sterling MT (c.l.)*	lb.	— -	.0400
MT Non-Staining (c.l.)*	lb.	— -	.0500
Thermax (c.l.)*	lb.	— -	.0400
Stainless (c.l.)	lb.	—	.0500

REINFORCING AGENTS—SILICA

Cab-o-sil*	lb.	.67 -	.85
D. C. Silica (pelletized)*	lb.	1.45 -	1.65
Hi-Sil 233*	lb.	.08 -	.09½
X303*	lb.	.40 -	.45
Santocel*	lb.	.62 -	.64
Valron Estersil*	lb.	2.00 -	2.25

REINFORCING AGENTS—MISCELLANEOUS

Angelo Shellac*	lb.	.40 -	.50
Darex Copolymer No. 3*	lb.	.47 -	.49
43G*	lb.	.39 -	.41
Darex Copolymer Latex No. 3-L	lb.	.41½ -	.46
Durez 12687 (and 12707)*	lb.	.36½ -	.40
Durez 13355*	lb.	.27½ -	.31½
Good-rite Resin 2007*	lb.	.36 -	.38
2057*	lb.	.30 -	.31
Hystron*	lb.	.39 -	.41
Kralac A-EP*	lb.	.39 -	.41
Lampblack	lb.	— -	.12
Marbon S and S-1*	lb.	.36 -	.43
8000*	lb.	.36 -	.43
Marmix	lb.	.35 -	.43
Mistron Vapor*	ton	— -	70.00
HGO-55*	ton	— -	95.50
Pliolite Latex 150*	lb.	.35 -	.39
Pliolite Resin-Rubber Masterbatches*	lb.	.33 -	.57
Pliolite NR*	lb.	.93 -	.95
S6B*	lb.	.36 -	.43
Plio-Tuf G85C*	lb.	.52 -	.54
Polyco 220*	lb.	.18¼ -	.19¼
Polypol S-70*	lb.	.25 -	.26

RETARDERS

Benzoic Acid TBAO-2*	lb.	— -	.44
Dutch Boy Normasal*	lb.	— -	.46
ESEN*	lb.	.35 -	.37
Good-rite Vultrol*	lb.	.67 -	.70
Harcopol 1183*	lb.	.70 -	.74
Retarder J*	lb.	.62 -	.64
PD*	lb.	.39 -	.41
W*	lb.	— -	.46
Retardex*	lb.	.46 -	.46
Wiltrol P	lb.	.39 -	.41

A girl's reputation is made, for better or for worse, by the company she keeps.

So is a publication's. And any publication bearing the ABC symbol couldn't be in better company. To bear this symbol, a publication must be a member of the Audit Bureau of Circulations. To be a member, a publication must live up to the highest standards of publishing—standards set by ABC, a nonprofit, cooperative organization of publishers, advertisers, and advertising agencies.

ABC provides a sure, reliable measurement of a publication's circulation performance, month after month. And to maintain circulation a publication must maintain its editorial strength—must be alert, progressive, constructive. Any loss of vitality will show immediately in circulation figures.

RUBBER AGE has maintained its position of leadership in the field by giving real and needed service to both the industry and the reader. By its unbiased and painstaking editing . . . its careful reporting of new methods and materials . . . its practical, creative help in eliminating waste and making business more profitable. In short, RUBBER AGE has devoted itself tirelessly to the cause of helping the reader do a better job.

We're proud to bear the ABC symbol. Proud of the company we keep. We're sure you'll judge us accordingly.

RUBBER AGE

101 West 31st Street, New York 1, New York

PUBLISHERS OF THE INDUSTRY'S ONLY DIRECTORY...RUBBER RED BOOK

RUBBER SUBSTITUTES

Mineral Rubber

Byerlyte*	ton	50.00	- 57.00
Hard Hydrocarbon (dms.)*	ton	53.00	- 60.00
Herron Flake*	ton	—	- 45.00
Mineral Rubber, Solid	ton	42.50	- 44.50
M. R. No. 38*	ton	57.00	- 70.00

Vulcanized Vegetable Oils

Amberex*	lb.	.29	- .36
Brown	lb.	.15	- .24
Car-Bel-Lite*	lb.	—	- .36
Neophax*	lb.	.17	- .27
Polyrex A and C*	lb.	.12	- .17
White	lb.	.15	- .26
670 Brown	lb.	.14¼	- .14¾

Miscellaneous Rubber Substitutes

G.B. Asphaltenes*	lb.	.06	- .06½
Gilsowax B*	lb.	.09	- .11
Resin No. 1098 (dms.)	lb.	—	- .62
No. 1198*	lb.	.46¾	- .49¾
Tysonite*	lb.	.26	- .26¼

SOLVENTS

Acetone (dlvd.)	lb.	.11	- .12
Amsco Lactol Spirits* (t.c.)	gal.	—	- .20
Naphthol Spirits*	gal.	—	- .19
Mineral Spirits*	gal.	—	- .18
Rubber Solvent* (t.c.)	gal.	—	- .19
Solv A* (t.c.)	gal.	—	- .22
Solv A-80* (t.c.)	gal.	—	- .23½
Solv B* (t.c)	gal.	—	- .28
Solv B-90* (t.c.)	gal.	—	- .31
Solv D* (t.c.)	gal.	—	- .30
Solv E*	gal.	—	- .30
Solv F*	gal.	—	- .30
Solv F-80*	gal.	—	- .32
Solv G*	gal.	—	- .36
Special Naphtholite* (t.c.)	gal.	—	- .19
Special Textile Spirits*	gal.	—	- .20
Super Hi-Flash Naphtha*	gal.	—	- .34
Super Naphtholite*	gal.	—	- .19
Textile Spirits* (t.c.)	gal.	—	- .20
Amyl Chlorides, Mixed (t.c.l.) (dms.)	lb.	—	- .11
Benzol 90%	gal.	.36	- .40
Butyl Acetate	lb.	.17	- .18
Butyl Alcohol	lb.	.17	- .18
Secondary (dlvd.)	lb.	.15	- .16
Tertiary (dlvd.)	lb.	.15	- .16
Carbon Bisulfide, Tech.	lb.	.0545	- .0161
Carbon Tetrachloride	lb.	.10¾	- .14¼
Cosol 1*	gal.	.37	- .43
2*	gal.	.42	- .48
Cyclohexane	gal.	.77	-110.00
85% (c.l.) (dms.)	gal.	—	- .90
Cyclohexanone	lb.	.29	- .31½
Diacetone, Pure (dlvd.)	lb.	.15½	- .16½
Dichlorethyl Ether (dms.)	lb.	.15½	- .16½
Dichloropentanes (t.c.l.) (dms.)	lb.	—	- .06
Dicom*	gal.	—	- .55
Halowax Oil*	lb.	.28	- .41
Heptanes* (t.c.)	gal.	.19	- .22
Hexanes (t.c.)	gal.	.19	- .22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.62	- .69
Ether, Ref. (dlvd.)	lb.	.09½	- .10½
Mersol*	gal.	.43	- .79
Mesityl Oxide (dlvd.)	lb.	.15	- .16
Methyl Acetone, Syn. (dms., dlvd.)	gal.	.66	- .72
Methyl Chloride	lb.	—	- .12¼
Methyl Ethyl Ketone	lb.	.15	- .16
Methyl Isobutyl Ketone (dlvd.)	lb.	.17	- .18
Methylene Chloride	lb.	—	- .12½
N-5 Pentane Mix* (t.c.)	gal.	—	- .13½
N-6 Hexanes* (t.c.)	gal.	—	- .14½
N-7 Hexanes* (t.c.)	gal.	—	- .13½
Penetrell*	gal.	.42	- .63
Perchlorethylene	lb.	—	- .11
Petrolene* (t.c.)	gal.	—	- .14125
Picolines, Alpha, Refined	lb.	.43½	- .44
Mixed	lb.	.32½	- .33
Proprietary Solvent (dms.)	gal.	.66	- .77
Propyl Acetate (t.c., dlvd.)	lb.	—	- .11¾
Alcohol (t.c., dlvd.)	lb.	—	- .11
Pyridine, Refined	lb.	.74½	- .75
Quinoline	lb.	.50	- .54¼
Rubber Solvent (t.c.)	gal.	—	- .16
Rubsol (t.c.)	gal.	—	- .12875
Skellysolve B (Hexanes)* (t.c.)	gal.	—	- .158
C (Heptanes)* (t.c.)	gal.	—	- .151
R (Rubber Solvent)*	gal.	—	- 1.29
Solvent, Crude, Light	gal.	.19	- .28
Solvesso 100* (t.c.)	gal.	.33	- .35
150 (t.c.)	gal.	.33	- —
Sunny South DD Dipentine*	gal.	.42	- .63
Sunny South DD Pine Oil*	lb.	—	- .15
Sunray*	gal.	.1140	- .1600
Toluene (dms.)	gal.	—	- .38
Toluol (t.c.)	gal.	.33	- .35

SOLVENTS (Cont'd)

Trichlorethane	lb.	—	- .12¾
Triglycol Dichloride	lb.	.63	- .64
Union Thinner 1* (t.c.)	gal.	—	- .174
5* (dms.)	gal.	—	- .199
7* (t.c.)	gal.	—	- .164
2-50 W Hi-Flash*	gal.	—	- .41
Xylol	gal.	.34	- .38

STABILIZING AGENTS (for Vinyl Resins)

Advastab BC-12*	lb.	.90	- .95
BC-74*	lb.	.70	- .75
BC-105*	lb.	.75	- .80
CH-101*	lb.	.60	- .65
CH-201*	lb.	.60	- .65
E-82*	lb.	90	- .95
JCX*	lb.	.62	- .67
L Paste*	lb.	.65	- .70
SN*	lb.	.47	- .52
T-10*	lb.	1.90	- 1.95
T-50-LT*	lb.	3.20	- 3.25
XBZ-155*	lb.	.69	- .74
XC-143*	lb.	.90	- .95
XE-98*	lb.	.53	- .58
Barca 10*	lb.	.75	- .80
Barium Ricinoleate (BVS)	lb.	—	- .70
Barium Stearate	lb.	.41	- .46
Basic Silicate White Lead	lb.	.16	- .17
Cadmium Ricinoleate	lb.	—	- 2.00
Calcium Ricinoleate	lb.	—	- .55
Dutch Boy DS-207*	lb.	—	- .54
Plumb-O-Sil A*	lb.	—	- .29¾
B*	lb.	—	- .31¾
Tribase*	lb.	—	- .26½
Dythal*	lb.	—	- .39½
Ferro 182* (dms.)	lb.	.70	- .76
200* (dms.)	lb.	1.33	- 1.43
203* (dms.)	lb.	.87	- .91
541* (dms.)	lb.	.35½	- .45½
541A* (dms.)	lb.	.82	- .86
700* (dms.)	lb.	.48¾	- .58¾
900* (dms.)	lb.	.90	- .94
903* (dms.)	lb.	.60	- .64
909* (dms.)	lb.	.91	- .95
920*	lb.	—	- .98
931* (dms.)	lb.	.75¾	- .85¾
993* (dms.)	lb.	.89	- .99
1203* (dms.)	lb.	1.30	- 1.40
1206* (dms.)	lb.	1.32	- 1.36
1820* (dms.)	lb.	.90	- .94
1825* (dms.)	lb.	1.00	- 1.04
1976*	lb.	.47	- .51
Harshaw 1-V-3*	lb.	.43	- .45
1-V-4*	lb.	.66½	- .70
1-V-7*	lb.	.70	- .72
2-V-4*	lb.	.85	- .87
2-V-7*	lb.	—	- 1.10
2-V-8*	lb.	—	- 1.30
5-V-1*	lb.	.41	- .43
7-V-1*	lb.	—	- .90
8-V-1*	lb.	.88	- .90
8-V-5*	lb.	—	- .80
8-V-100*	lb.	.82	- .84
9-V-1*	lb.	.70	- .72
12-V-5*	lb.	.73	- .75
24-V-1*	lb.	1.10	- 1.12
28-V-2*	lb.	—	- 1.18
128-V-5*	lb.	.86	- .88
Lithium Stearate	lb.	.52	- .57
Fluffy	lb.	.47½	- .70
Standard	lb.	.52½	- .75
Mark A*	lb.	2.80	- 3.15
C*	lb.	.81	- .84
E*	lb.	.72	- .75
GS*	lb.	.77	- .80
M*	lb.	.59	- .62
PL*	lb.	.62	- .65
TT*	lb.	.72	- .75
WS*	lb.	.97	- 1.00
X*	lb.	2.50	- 2.75
XL*	lb.	.87	- .90
XV*	lb.	.84	- .87
XX*	lb.	.57	- .60
Metasap 613-A*	lb.	—	- .69
613-B*	lb.	—	- .84
613-C*	lb.	—	- 1.06
621*	lb.	—	- .88
624*	lb.	—	- .75
633*	lb.	—	- .75
635*	lb.	—	- .45
Modicol N*	lb.	.42½	- .44½
S*	lb.	.30⅞	- .32⅞
Sodium Silicates 41°/1:32	cwt.	1.20	- 2.30
Stabelan E*	lb.	1.40	- 1.50
XL*	lb.	.55	- .65
HR-50*	lb.	.75	- .90
HR Liquid*	lb.	.65	- .75
HR Paste*	lb.	.85	- .95
HR Powder*	lb.	.95	- 1.05
No. 110 Liquid	lb.	.65	- .75
No. 115 Liquid	lb.	.85	- .95
No. 120 Liquid	lb.	.65	- .75
Stabilizer No. 52*	lb.	1.90	- 2.00
89X*	lb.	.75	- .80
B-5*	lb.	—	- .70
E6B*	lb.	—	- .95
G-1*	lb.	1.25	- 1.40
HR*	lb.	.85	- .89
I*	lb.	—	- .60
OM-10*	lb.	—	- 1.95

STABILIZING AGENTS (Cont'd)

Staflex OY*	lb.	1.00	- 1.20
QXMA*	lb.	—	- .70
Stayrite 10*	lb.	.36	- .41
P-10*	lb.	.43	- .45
15*	lb.	.55	- .57
20*	lb.	.41	- .46
22*	lb.	1.00	- 1.13
25*	lb.	.35	- .40
70*	lb.	.70	- .72
71*	lb.	.90	- .92
75*	lb.	.61	- .63
76*	lb.	.53	- .55
80*	lb.	.70	- .72
90*	lb.	.70	- .72
95*	lb.	.70	- .72
229*	lb.	.61	- .63
Vanstay A* (dms.)	lb.	.50	- .53
AB* (dms.)	lb.	.46	- .49
CE* (dms.)	lb.	.44	- .47
HT* (dms.)	lb.	.87	- .90
HTA* (dms.)	lb.	.97	- 1.00
HTB* (dms.)	lb.	.70	- .73
HTC* (dms.)	lb.	1.09	- 1.12
L* (dms.)	lb.	.32	- .35
R* (dms.)	lb.	.67	- .70
RZ-25* (dms.)	lb.	.65	- .69
S* (dms.)	lb.	.57	- .60
SA* (dms.)	lb.	.81	- .84
W* (dms.)	lb.	1.22	- 1.25
X* (dms.)	lb.	.67	- .70
Z* (dms.)	lb.	.62	- .65

STIFFENING AGENTS

Polyac*	lb.	—	- 1.85
Processing Stiffener 710*	lb.	—	- .88
Solvitose HDF, H. C-S, T, and E*	lb.	.22	- .25
Versatil Gum 8-E*	lb.	.15	- .19

SUN CHECKING AGENTS

Allied AA-1144*	lb.	.23	- .24
AA-1177*	lb.	.15½	- .16½
Antisol*	lb.	—	- .23
Antisun* (Chipped)	lb.	.15½	- .17½
(Slabbed)	lb.	.15	- .17
Heliozone*	lb.	.31	- .32
Microflake*	lb.	.20	- .24
Nacconol NRSF*	lb.	.40½	- .45
NBC*	lb.	—	- 1.67
Ross Sunproofing Waxes*	lb	—	- .15
Sunolite*	lb.	.16	- .22
127*	lb.	.16½	- .20½
154*	lb.	.23	- .25
Sunproof*	lb.	.31	- .32
713*	lb.	.25	- .26
Improved*	lb.	.25	- .26
Super*	lb.	.40	- .41
Jr.*	lb.	.20	- .21
Tonox*	lb.	.52	- .54

SURFACE ACTIVE AGENTS

Anhydrapent*	lb.	.56	- .59
Anhydrol 6990*	lb.	.51	- .56
6991*	lb.	.51	- .56
Aquarex D*	lb.	—	- .78
G*	lb.	—	- .21
MDL*	lb.	—	- .33
ME*	lb.	—	- .80
NS*	lb.	—	- .60
SMO*	lb.	—	- .50
WAQ*	lb.	—	- .20
Emulphor EL-620*	lb.	—	- .40
EL-719*	lb.	—	- .58
ON-870*	lb.	—	- .55
Hyonics*	lb.	—	- .28¾
Igepal CA-630	lb.	—	- .29
CO-630	lb.	—	- .29
CO-730	lb.	—	- .29
CO-850*	lb.	—	- .29
CO-880*	lb.	—	- .29
Igepon CN-42*	lb.	—	- .25
T-33*	lb.	—	- .21
T-51*	lb.	—	- .13½
T-77*	lb.	—	- .49
Kessco 50201*	lb.	—	- .44½
50203*	lb.	—	- .44¼
18201*	lb.	—	- .32
18203*	lb.	—	- .35½
Lipal 9-N,* 11-0*	lb.	.28	- .29
8-0,* 6-0*	lb.	.29	- .30
25C,* 52C*	lb.	.34	- .35
15T*	lb.	.23	- .24
Pluronic L62*	lb.	.33½	- .39
L64*	lb.	.33½	- .39
Sellogen Gel*	lb.	—	- .12¾
Soybean Lecithin	lb.	.13	- .17
Synatol AV-60*	lb.	.28	- .29

TACKIFIERS

Amalgamator Z-4*	lb.	.34	- .35
Arceo 620-32B*	lb.	.20½	- .21½
716-30*	lb.	.18½	- .19½
1041-21*	lb.	.16½	- .17½
A-26*	lb.	.18	- .19
Bunaweld Polymer No. 780*	lb.	—	- .24
No. 5514*	lb.	—	- .35
Galex* (dms.)	lb.	.16	- .18¾
Indopol H-300*	gal.	1.00	- 1.22
Koresin*	lb.	—	- .95
Liquid Rubber Flux*	lb.	—	- .14
Nacconal NRSF* (dlvd.)	lb.	.40½	- .45
Nilox Resin* (c.l.)	cwt.	—	- 16.00

TACKIFIERS (Cont'd)

PR-162 Resin Emulsion (dms.)	lb.	.82	——
Resin V	lb.	——	.23½
Synthol*	lb.	.17	.24¾
Vistac A*	lb.	.21½	.22¼
Vistanex LM Grades*	lb.	——	.45
Zirex* (c.l.)	cwt.	——	15.25

THICKENERS (For Latex)

Alcogum AN-6*	lb.	.05½	.06
AN-10*	lb.	.09	.10
AN-25*	lb.	——	.31
PA-15*	lb.	——	.16
Betanol* (dms.)	lb.	.70	.95
Gomme Labolene*	lb.	.45	.47
Good-rite K-702*	lb.	.28½	.37
K-704*	lb.	.21	.22
K-705*	lb.	.30	.39
K-707*	lb.	.18	.19
K-708*	lb.	.28	.37
K-710*	lb.	.15	.16
Hycryl A-1000* (t.l.)	lb.	.090	.100
A-2000* (t.l.)	lb.	.335	.360
Modicol VD*	lb.	.13⅜	.14⅜
VE*	lb.	.13⅜	.14⅜
Polyco 296 BT*	lb.	.15	.16
296-N*	lb.	.15	.16
530*	lb.	.15	.16
Propylene Laurate (dms.)	lb	.57	.82
Sodium Silicate, 41°/1:3.2	cwt.	1.20	2.30
Solvitose Series*	lb.	.22	.25

VULCANIZING AGENTS

Peroxide

UC XK-1960*	lb.	5.50	——

Selenium

Vandex*	lb.	——	7.00
VA-7*	lb.	——	.50

Sulfur

Blackbird* (c.l.)	cwt.	——	2.85
Cloud* (c.l.)	cwt.	——	2.80
Crystex*	lb.	.19½	.23
Darex Dispersed Sulfur*	lb.	.14	.16
Devil A* (c.l.)	cwt.	——	2.40
Dispersed Sulfur	lb.	.14	.16
Insoluble Sulfur 60*	lb.	.12½	.13
Ko-Blend IS*	lb.	——	.39
Mist* (Wettable) (c.l.)	cwt.	——	4.00
Spider* (c.l.)	cwt.	——	2.80
Star* (c.l.)	cwt.	——	3.25
Sulfasan R*	lb.	1.55	1.57
Tire* (c.l.)	cwt.	——	2.55
Tube* (c.l.)	cwt.	——	4.40

VULCANIZING AGENTS (Cont'd)

Vultac 2*	lb.	.47	.49
3*	lb.	.51	.53

Tellurium

Telloy*	lb.	——	2.65

WETTING AGENTS

Advawet No. 10*	lb.	——	.17
No. 33*	lb.	——	.17
Aerosol 18*	lb.	.37	.42
AY*	lb.	.75	.80
MA 80%*	lb.	.40	.45
OT 75% Aqueous*	lb.	.40	.45
OT 100%*	lb.	.75	.80
OT-B*	lb.	.65	.70
Alrosol* (dms.)	lb.	.35	.41
Alrosperse*	lb.	——	.18
Anhydrol 6990* and 6991*	lb.	.51	.56
Areskap 50*	lb.	.50	.56
Dry 100*	lb.	.60	.64
Aresket Dry 300*	lb.	.60	.64
Aresklene 375*	lb.	.42	.47
Armac*	lb.	.28	.77
Arquads*	lb.	.42	.61
Emcol 5100* (dms.)	lb.	——	.31
Energetic W-100	lb.	.28½	.35
Etho-Chemicals*	lb.	.26	.58
Ethomeen S/15*	lb.	.48	.50
T/15*	lb.	.46	.48
Kessco E-122* (dms.)	lb.	——	.45
18201*	lb.	——	.32
Kreelon 4D* (dms.)	lb.	.13	.16
8G* (dms.)	lb.	.26	.28
Kyro EO* (dms.)	lb.	——	.29½
Modicol N*	lb.	.42½	.44½
S*	lb.	.30⅞	.32⅞
Nacconol SL* (dlvd.)	lb.	.084	.10
60S* (dlvd.)	lb.	.19	.225
Nacconol A* (dlvd.)	lb.	——	.52
Nekal WS-25	lb.	——	.48
WS-99	lb.	——	.62
Orvus AB Granules*	lb.	.16¼	.17¾
Parnol*	lb.	——	.13½
Regal Beads	lb.	.12¾	.16¾
H. D. Beads	lb.	.12¾	.15¾
Santomerse No. 3	lb.	.41	.45
S*	lb.	1.55	1.85
Sorapon SF-73*	lb.	——	.18
SF-78*	lb.	——	.30
Sorbit P*	lb.	——	.28
Soybean Lecithin	lb.	.13	.17
Stablex G*	lb.	.50	.60
Tergitol 4* (dms., dlvd.)	lb.	.36½	.37½
7* (dms., dlvd.)	lb.	.43½	.44½
08* (dms., dlvd.)	lb.	.36½	.37½
P28* (dms., dlvd.)	lb.	.18½	.19

WETTING AGENTS (Cont'd)

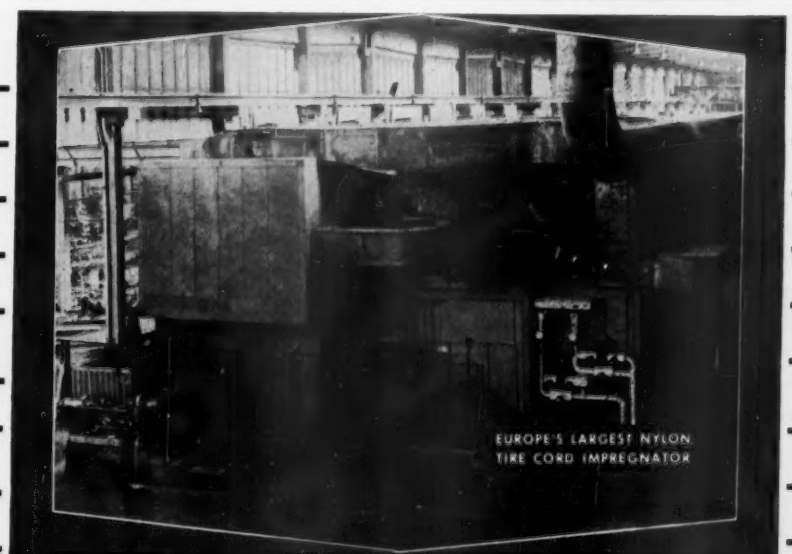
Trenamine W-30	lb.	——	.15
Vultamol*	lb.	——	.17½
Wetsit Conc.*	lb.	.35	.35

MISCELLANEOUS CHEMICALS

Aquesperse 30*	lb.	——	.11
Arccopel W-18*	lb.	.17	.19
Black-Out Black, Clear & White	gal.	4.50	8.00
Chiplac Plaint	gal.	1.15	5.00
Copper Inhibitor No. 65*	lb.	——	1.57
D-1ac*	lb.	——	.22
2-Ethyl Hexanol	lb.	.23¾	.24¼
Fura-Tone Resin 1226*	lb.	.41	.43
MODX*	lb.	.38	.40
Nacconates* (dms.)	lb.	.99	3.53
Para Resins*	lb.	.04	.04½
Pigmented Filmite* (dlvd.)	lb.	.16¼	——
Resorcin, Tech.	lb.	.27½	.81½
Rio Resin*	lb.	.70	.72
Rongalite CX*	lb.	——	.21½
Sherosopes*	lb.	.13½	.18¾
Sublac Resin PX-5*	lb.	.23½	.24½
Synpep*	lb.	.54	.60
Thiokol LP-205*	lb.	——	4.00
Tysonite*	lb.	.30	.30¼
Vanfre*	gal.	2.45	3.00
No. 3* & No. 4*	gal.	1.95	2.00

SUPPLIERS

Are Your Materials Listed in the Market Prices Section? if not Forward full Information to Market Editor RUBBER AGE 101 West 31st St. New York 1, N. Y.



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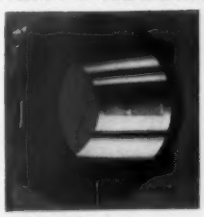

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